POST-CLOSURE PLAN

Caribbean Petroleum Corporation
Bayamon, Puerto Rico

Revised: December 1994

1. Introduction

Caribbean Petroleum Corporation has developed this Post-Closure Plan in accordance with 40 CFR 264/265 Subpart G. This plan provides a description of the monitoring, maintenance, and inspection activities to be carried out after final closure of the Equalization Basin. These activities will ensure that the integrity and effectiveness of the cover is maintained and that sampling of the groundwater will be conducted as required during the post-closure care period. In addition, this plan describes all notification and certification procedures to be carried out by CPC during and after the post-closure care period.

Post closure care activities will commence immediately upon completion of closure of the Equalization Basin and will continue for a period of thirty years.

This plan will be amended in accordance with 40 CFR 264/265.118(d) if and when changes in facility design affect the approved post-closure plan, there is a change in the expected year of closure, or events which occur during the active life of CPC's facility affect the approved post-closure plan.

The following person may be contacted about the Equalization Basin during the post-closure care period:

Mr. Fernando Quinones
Technical, Safety and Environmental Manager
Caribbean Petroleum Corporation
Luchetti Industrial Park
Bayamon, Puerto Rico
809-785-0520

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2. Post-Closure Notices

Within 60 days of certification of final closure, CPC will submit to the local zoning board, to the Puerto Rico Planning Board, and to the USEPA, Region II, a record of the type, location, and quantity of hazardous wastes disposed of within the Equalization Basin, as required by 40 CFR 264/265.119(a).

Within 60 days of certification of final closure, CPC will record a notation on the deed to the facility that will in perpetuity notify any potential purchaser that the land has been used to manage hazardous waste, its use is restricted under 40 CFR Subpart G regulations, and that all required information relating to hazardous waste management practices has been filed with local zoning authorities and other appropriate parties, as required by 40 CFR 264/265.119(b). CPC will submit a certification to EPA that notation has occurred as described above.

As required by 40 CFR 264.119(c), if CPC wishes to remove hazardous waste residues or contaminated soils from the unit at a future date, CPC will request a modification to the post-closure permit in accordance with the terms of 40 CFR 124 and 270.

3. Facility Inspections

The objective of CPC's post-closure inspection program is to identify potential problems and maintenance requirements and to ensure that the integrity of the cover is maintained, that the drainage system is functioning properly, and that all monitoring systems and security devices remain in good operating condition.

Table 1 includes a description of items to be inspected, types of problems to identify, and frequency of inspections.

In addition to the routine inspection schedule described above, an independent professional engineer will perform an annual inspection to ensure against structural failure of dikes and excessive settlement and subsidence of cover. During the annual inspection, the engineer will visibly examine all earth dikes for erosion, settlement, fissures, gullies, and

other conditions that may impair the structural stability of the dikes. Corrective actions will be implemented as necessary.

The engineer will also visually assess the landfill cover for excessive settlement and subsidence. Assessment will involve observation of variations in surface level, excessively moist areas, areas of stressed vegetation that may indicate ponding, and other abnormal conditions. If the engineer suspects that there may be a problem with settlement or subsidence, the cover will be surveyed by a licensed surveyor to determine the extent of any settlement or subsidence.

4. Post-Closure Groundwater Monitoring Program

The post-closure groundwater monitoring system is designed to satisfy the objectives of an area-wide corrective action program as well as the intent of 40 CFR 264 Subpart F regulations. The system will be implemented upon approval by EPA. Enhancements to the proposed system may be developed based on the results of the ongoing interim status groundwater assessment program and after evaluation of the results of the area wide groundwater investigation of the wastewater treatment plant. The area-wide investigation is discussed in Chapter 10 of the Post-Closure Permit Application.

4.1 Location of Monitoring Wells

Six groundwater monitoring locations in the uppermost aquifer have been selected for post-closure groundwater monitoring of the Equalization Basin. The well locations have been selected to provide upgradient and downgradient monitoring of the basin. The six wells that will be sampled on a regular basis are:

EB-103, EB-101, EB-112	upgradient
EB-109, EB-110A, EB-111	downgradient

A map showing the location of these wells is presented in Figure 1.

This system is designed to monitor for both upgradient impacts to the Equalization Basin (EB-103, EB-101, EB-112), and downgradient impacts from the Equalization Basin and general wastewater treatment plant area (EB-109, EB-110A, EB-111).

Two of the wells (EB-101, EB-103) are currently part of CPC's interim status groundwater monitoring network. The remaining wells will be installed as part of the Corrective Action Program.

4.2 Well Construction Details

All wells for the post-closure groundwater monitoring system will be constructed and installed according to EPA requirements for RCRA groundwater monitoring wells. PVC casing and screen conforming to ASTM 1784/1785 and F-480 standards will be used. A sand pack will be placed opposite the screen with an overlying bentonite seal. The wells will be grouted to the surface with neat cement. A security casing will also be installed at each well.

4.3 Groundwater Sampling Frequency and Parameters

The sampling frequency and groundwater sampling parameters are discussed below.

Sampling Frequency

The wells will be sampled quarterly for one year and semi-annually for two years. The quarterly samples will provide baseline information concerning the quality of the groundwater in the vicinity of the Equalization Basin. The subsequent semi-annual sampling will be performed for comparison with the baseline data.

After three years of groundwater monitoring, the data will be evaluated. If the data provides evidence that the Equalization Basin is not releasing hazardous constituents, the groundwater monitoring program will be terminated with EPA approval. Otherwise, semi-annual sampling will continue for an additional three year period, at which time data will again be evaluated and a decision will be made to terminate the system or to continue monitoring with a decreased frequency.

Sampling Parameters

The wells will be sampled for the first four quarters for Modified Skinner List constituents. Constituents contained in the Modified Skinner List is presented in Table 2. After evaluation of the Modified Skinner List results, a subset of representative constituents will be selected and scheduled for future analysis. The subset will be confirmed with EPA. Field measurements for specific conductivity and pH will also be performed. Samples will be analyzed using the SW-846 methods presented in the sampling and analysis plan presented in the Post-Closure Permit Application.

Groundwater Level Monitoring

Water levels will be measured at all post-closure monitoring wells prior to initiation of sampling activities. In addition, water levels will be collected at the following well locations: EB-102, EB-107, EB-108, EB-113, EB-114, EB-115, 15A, 16A, 36A, 54A, and 65A. The locations of these wells are presented in Figure 1. The additional water level data will be used to provide a more comprehensive evaluation of groundwater flow direction and velocity in the vicinity of the Equalization Basin.

Statistical Testing

If statistical testing according to 40 CFR 264 is possible, it will be performed. The apparent presence of contamination upgradient of the Equalization Basin, however, may preclude valid statistical testing. In such case, comparisons will be made with relevant groundwater quality standards.

5. Maintenance

CPC will ensure that all structures and equipment are maintained in proper operating condition during the post-closure period. The objectives of the program are to maintain the integrity and effectiveness of the final cover, maintain and monitor the groundwater monitoring system, and prevent runoff from eroding or otherwise damaging the cover.

The waste containment system consists of the cover system, including the drainage layer and associated piping. Maintenance of the waste containment system will include, as necessary, repairs to the cap to correct the effects of settling, subsidence, erosion, or other events. In addition, maintenance of the drainage system will ensure that precipitation is properly removed from the cover system.

The only monitoring equipment that will require maintenance during the post-closure care period is that associated with the groundwater monitoring system. Maintenance of the monitoring equipment will include, as necessary, routine cleaning in the vicinity of the well and structural repairs to the wells and caps. In addition, repairs to security and monitoring devices and surveyed benchmarks will be conducted as required.

Table 3 includes a description of problems that may be encountered during the post-closure care period and any preventive or corrective action measures that may be required to remedy the problems.

6. Post-Closure Certification

Within 60 days of completion of the post-closure care period, CPC will submit to EPA a certification, signed by CPC and an independent professional engineer, that post-closure care was performed in accordance with the specifications set forth in this plan. Documentation supporting the engineer's certification will be made available to EPA until such time as EPA releases CPC from post-closure financial responsibility requirements.

Table 1

Post-Closure Inspection Program

ITEM	TYPE OF PROBLEM	FREQUENCY
Security Devices	Integrity of fence Broken/missing locks Missing/damaged signs	Monthly Monthly Monthly
Cover/Cap	Cracks Standing water Excessive settlement Change in slope Fissures in berm Erosion, gullies	Monthly* Monthly* Monthly* Monthly* Monthly* Monthly*
Drainage Layer	Reduction in flow Flow stoppage Discolored flow	Monthly* Monthly* Monthly*
Vegetative Cover	Exposed topsoil Stressed vegetation Undesirable growth Excessive height	Monthly* Monthly* Monthly* Monthly*
Monitoring Wells	Structural integrity Tampering with caps Clogging of well Damaged benchmark	Semi-annually Semi-annually Semi-annually Semi-annually
Surveyed Benchmarks	Damage Tampering	Monthly Monthly

* These items will also be inspected after storms.

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Table 2

Appendix VIII Hazardous Constituent Subset for Petroleum Industry Studies* (Skinner List)

Metals

Antimony

Arsenic

Barium

Beryllium

Cobalt

Cadmium

Chromium

Lead

Mercury

Nickel

Selenium

Vanadium

Volatile Compounds

Benzene

Carbon disulfide

Chlorobenzene

Chloroform

1,2-dichloroethane

Ethylbenzene

Ethylene dibromide

Methyl ethyl ketone

Styrene

Toluene

Xylene(m-, o&p)

1,4-Dioxane

Semi-Volatile Base/Neutral Extractable Compounds

Anthracene

Benzo(a)anthracene

Benzo(b)fluoranthene

Benzo(k)fluoranthene

Bis(2-ethylhexyl)phthalate

Benzo(a)pyrene

Butyl benzyl phthalate

Chrysene

Dibenz(a,h)anthracene

Dichlorobenzenes

Diethyl phthalate

Dimethyl phthalate

7,12-Dimethylbenz(a)-anthracene

Di(n)octyl phthalate

Di(n)butyl phthalate

Fluoranthene

Indene

1-methylnaphthalene

Naphthalene

Phenanthrene

Pyridine

Pyrene

Quinoline

Semi-Volatile Acid Extractable Compounds

p-Cresol

m-Cresol

o-Cresol

2,4-dimethylphenol

Phenol

2,4-dinitrophenol

Benzenethiol

4-nitrophenol

* "Petitions to Delist Hazardous Waste - A Guidance Manual," EPA/530-SW-85-003, April 1985.

Table 3

Post-Closure Maintenance Program

ITEM	PREVENTATIVE MAINTENANCE	CORRECTIVE MEASURES
Security Devices	Paint fences Remove undergrowth	Replace signs Repair holes in fence Repair sections of fence/gates
Cover/Cap	Fertilize/mow cover Remove undesired vegetation	Fill ruts, gullies Fill cracks Regrade sections of cover Recompact cover Replant vegetative cover
Monitoring Wells	Routine cleaning	Repair well Secure cap
Surveyed Benchmarks	Clearing of vegetation	Resurvey

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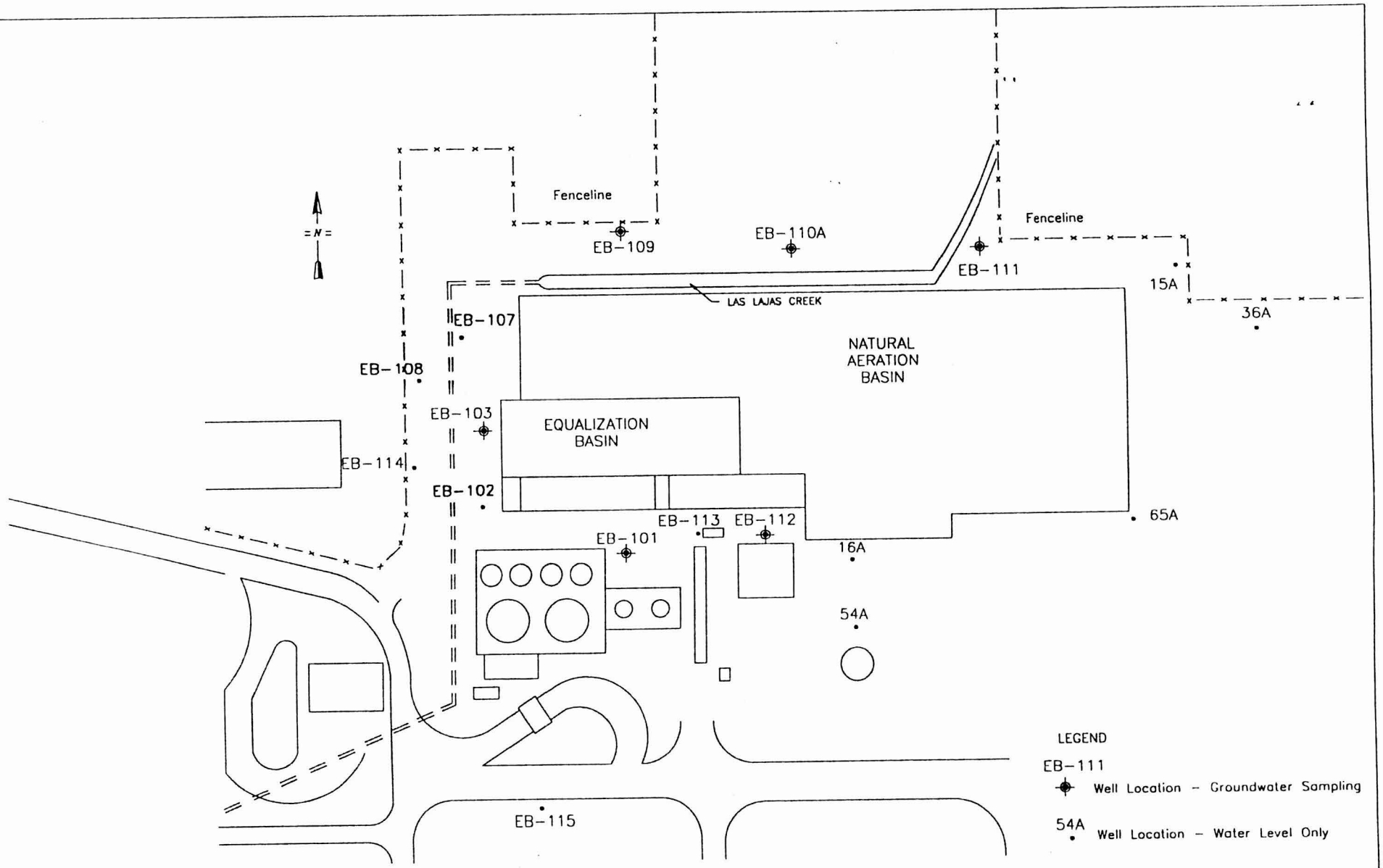

CARIBBEAN PETROLEUM CORPORATION	
FIGURE 1 POST CLOSURE MONITORING SYSTEM	
ANDERSON-MULHOLLAND & ASSOC., INC	
SCALE	AUTOCAD FILE # / DATE
DR: _____ CH: _____	

Caribbean Petroleum Corporation
Refining & Marketing
P.O. Box 361988, San Juan, P.R. 00936-1988
Tel. 809/785-0520 • Fax: 809/787-6165 /787-1245
Telex: 3252462 (CARECO) EASYLINK-62874227

December 2, 1994

Mr. Andrew Bellina, P.E.
Chief, Hazardous Waste Facilities Branch
U.S. Environmental Protection Agency
Region II
26 Federal Plaza
New York, NY 10278

RE: RCRA Part B Post -Closure Permit Application, EPA ID No. PRD00632182

Dear Mr. Bellina:

This letter is in response to your letter of October 17, 1994, in which EPA provided comments on: a) Caribbean Petroleum Corporation's (CPC) Revised Closure Plan submittal of December 1993; and b) the RCRA Part B Post-Closure Permit Application dated April 13, 1994. For ease of the presentation of material, this letter responds only to EPA's comments on the RCRA Part B Post-Closure Permit Application. CPC's response to EPA's comments on the Closure Plan is being submitted under separate cover. This transmittal includes the following:

1. A response to each comment raised in the Attachment to the October 17 letter relating to the Post-Closure Permit Application.

2. A revised RCRA Part B Post-Closure Permit Application.

The form and content of CPC's response was discussed at a meeting held at your offices on November 21, 1994 between CPC's technical consultant, Mr. Herbert Mulholland, and EPA's RCRA permit writer, Mr. Ernest Jabouin. Also at that meeting, Mr. Jabouin agreed to allow CPC to submit its response on December 7, 1994. Our response to individual EPA comments, as well as the format of the Application, is based on agreements reached at that meeting.

As you know, CPC has been actively negotiating a RCRA Corrective Action Order with the Hazardous Waste Facilities Branch. In accordance with these negotiations, CPC has submitted to EPA a document entitled "Area-Wide Wastewater Treatment Plant Groundwater Monitoring Program." As discussed with EPA, this program is designed to

address groundwater concerns of both the RCRA Permit Program and the RCRA Corrective Action Program. Therefore, it is important that this document be considered by EPA within the context of the Post-Closure Permit Application.

Although CPC is submitting a RCRA Post-Closure Permit Application as requested by EPA, CPC maintains it position that a Post-Closure Permit is not necessary and that the Corrective Action Program is a more effective approach to ensuring effective post-closure care of the Equalization Basin.

If you need additional information on this subject matter, please call use at (809) 785-05020.

Sincerely yours,

Julio D. Hernández
Refinery Manager

ecc

Attachments
env94\ebasin6

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Julio D. Hernández

Caribbean Petroleum Corporation
Bayamon, Puerto Rico

RCRA Post-Closure
Permit Application

December 1994

Prepared by
Anderson-Mulholland & Associates, Inc.
New York, New York

Caribbean Petroleum Corporation
Bayamon, Puerto Rico

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1. FACILITY DESCRIPTION

This section provides a general description of Caribbean Petroleum Corporation in Bayamon, Puerto Rico. This information is submitted in accordance with 40 CFR 270.14(b)(1).

1.1 General Information

Caribbean Petroleum Corporation (CPC) is a wholly owned subsidiary of First Oil Corporation, a privately held corporation, incorporated in the State of Delaware, with principal offices in London, England. CPC is located in the Luchetti Industrial Park, Bayamon, Puerto Rico. The mailing address, telephone and facsimile numbers are:

GPO Box 361988
San Juan, Puerto Rico 00936
(Tel: 809-785-0520, FAX: 809-787-1245)

1.2 Facility Description and Location

The CPC facility is located in the Luchetti Industrial Park in Bayamon in the Commonwealth of Puerto Rico. The plant is about five miles south of the northern coast of the island and the Caribbean Sea. Geographic coordinates are: latitude 18° 25′ 30″, longitude 66° 8′10″. Figure 1.1 shows a general map of the Caribbean area including Puerto Rico. Figure 1.2 shows the location of CPC facility in relation to the island.

Figure 1.3 is a more detailed map that shows the location of CPC within the town of Bayamon. The site is bounded to the west by industrial facilities, to the south and east by Fort Buchanan, a U.S. military reservation, and to the north by undeveloped land. Chapter 9 of this Application provides further information on the location of the site.

The CPC site encompasses approximately 179 acres, of which 115 is developed. The facility is divided into a tank farm, a process area, an administration area, and a wastewater treatment facility. In addition, CPC owns and operates a loading dock facility on San Juan Bay in Catano, approximately two and one-half miles from the site. Figure 1.4 provides a plot plan of the site showing the location of buildings and structures on the site. Attachment

A is a large-scale plot plan of the facility.

1.3 Facility Operations

CPC operates a 43,000 barrel per day petroleum refining facility at the site. Refinery operations commenced at the site in 1955 under the name of Caribbean Refining Corporation. The facility was purchased in 1962 by the Gulf Oil Corporation, at which time the name was changed to Caribbean Gulf Refining Corporation. Chevron Corporation acquired ownership of the site when it purchased the Gulf Oil Corporation in 1984. In 1987, the facility was sold to First Oil International and now operates as an independent refinery.

The facility consists of the following areas:

Terminal - Crude oil is received from vessels at a docking facility located on the southern shore of San Juan Bay in Catano. An average of four or five vessels per week load or unload at the terminal. From the dock, crude oil is pumped via an aboveground pipeline system approximately two and one-half miles to the CPC site, where it is stored in aboveground tanks prior to processing. In addition, CPC products are pumped from the refinery to the terminal for transportation off the island.

Tank Farm - CPC's tank farm includes approximately 40 aboveground steel tanks ranging in capacity from 500 to over 200,000 barrels. The tanks are used for storage of crude as well as final products. All tanks are properly bermed in accordance with appropriate spill prevention control requirements. The tank farm also includes an LPG storage area.

Process Area - CPC processes crude oil through two crude distillation units, a fluidized catalytic cracking unit, a vacuum distillation unit, a catalytic reforming unit, a hydrotreater unit, and other ancillary operating units. Major products include unleaded gasoline, fuel oil, fuel gases, kerosene, diesel fuel, residual fuels, petroleum distillates, and asphalt. There is no manufacturing of secondary petrochemicals at the site. Products are either distributed to local markets through tanker truck or pipeline or are transferred via pipeline to the docking facility for transportation off the island.

Administration Area - This area consists of office space, maintenance shops, laboratory facilities, and ancillary operations.

1.4 Hazardous Waste Management

CPC's petroleum refining process generates a number of wastes that are regulated as hazardous under the authority of Subtitle C of the Resource Conservation and Recovery Act. The facility does not receive any hazardous wastes from off-site sources. Specific wastes currently generated and their corresponding EPA hazardous waste number are listed below:

K049	Slop oil emulsion solids
K050	Heat exchanger bundle cleaning sludge
K051	API separator sludge
F037	Primary oil/water/solids separation sludge
F038	Secondary oil/water/solids separation sludge/float
D001	Ignitable
D018	TCLP toxic - benzene

In addition, small quantities of listed and characteristic hazardous wastes may be periodically generated as a result of routine operation and maintenance activities. These wastes are accumulated at the point of generation and/or are placed in a container storage area for periods not exceeding 90 days in accordance with all requirements of 40 CFR 262. Timing of off-site transfers of hazardous wastes generally coincides with routine maintenance of the wastewater treatment plant units, Sludges are periodically removed from the solids knockout pit (F037), API separator (F051), and CPI unit (F037). Upon removal from the tanks, the waste is containerized and placed in CPC's 90 day storage area, Sludges are then transferred from CPC's facility as soon as possible, but in no case in excess of 90 days. These wastes account for the vast majority of hazardous wastes generated at the facility which are destined for off-site management. Other hazardous wastes that are generated on an irregular basis are also removed from the site within 90 days.

From November 19, 1980, the effective date the applicable hazardous waste regulations, until September 25, 1990, the effective date of the Toxicity Characteristic Leaching Procedure (TCLP) regulations, CPC and its corporate predecessors operated the facility as a generator in accordance with 40 CFR Part 262. All hazardous wastes were

removed from the site within 90 days of generation.

With the promulgation of the TCLP regulations, CPC became subject to regulation as a treatment, storage, and disposal facility. As part of its wastewater treatment facility, CPC operated an Equalization Basin. The basin received effluent from oil/water separation units and discharged into a biological treatment plant. The Equalization Basin is an unlined surface impoundment that was regulated because it managed the following wastes:

D018 The Equalization Basin influent exhibited the toxicity characteristic due to benzene levels in excess of 0.5 mg/l in the extract.

F038 Sludge generated in the basin was regulated as a secondary oil/solids/water sludge due to the potential presence of benzene, benzo(a)pyrene, chrysene, lead, and chromium. The sludge has been tested using the Toxicity Characteristic Leaching Procedure and was found not to exhibit toxicity characteristics.

CPC submitted a Part A Application on September 24, 1990, and a revised Part A on May 1, 1991. CPC submitted a Part B Permit Application in September 1991.

In June 1993, CPC ceased discharge of process wastewater into the Equalization Basin. In April 1994, sludge was removed from the unit. Currently, the unit is out of service and will undergo closure upon EPA approval of the Closure Plan.

CPC operates no other hazardous waste treatment, storage, or disposal facilities that are subject to regulation under Subtitle C of RCRA.

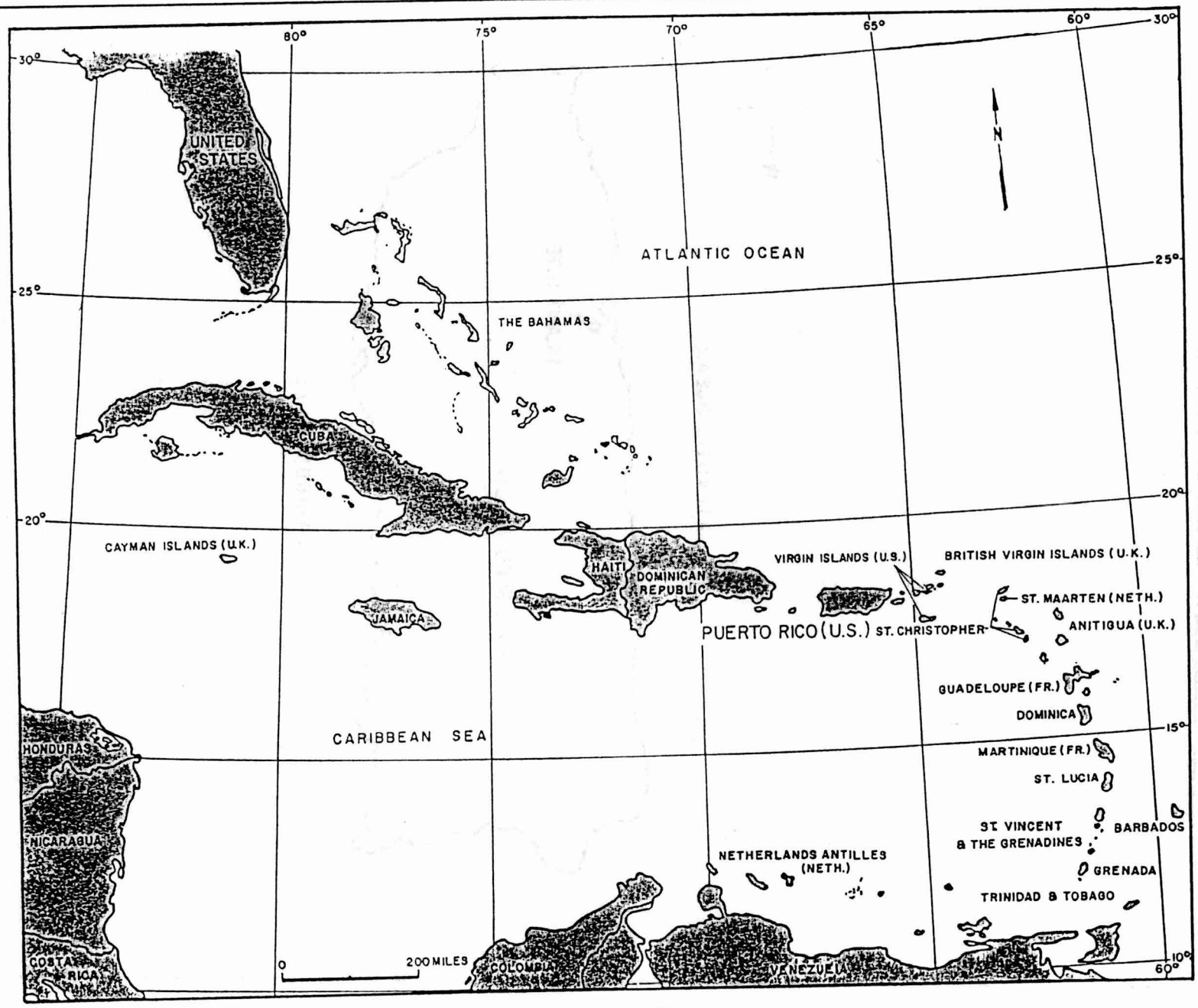


Figure 1.1

Regional Map of the Caribbean Showing the Location of Puerto Rico

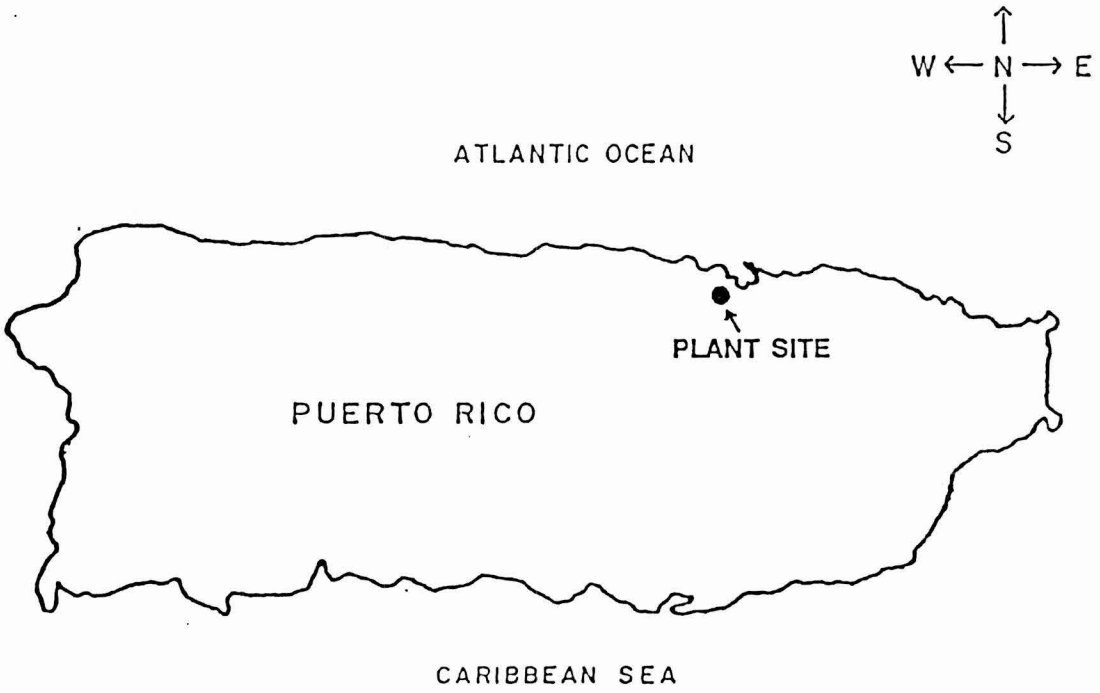


Figure 1.2

Location of CPC Plant within Puerto Rico

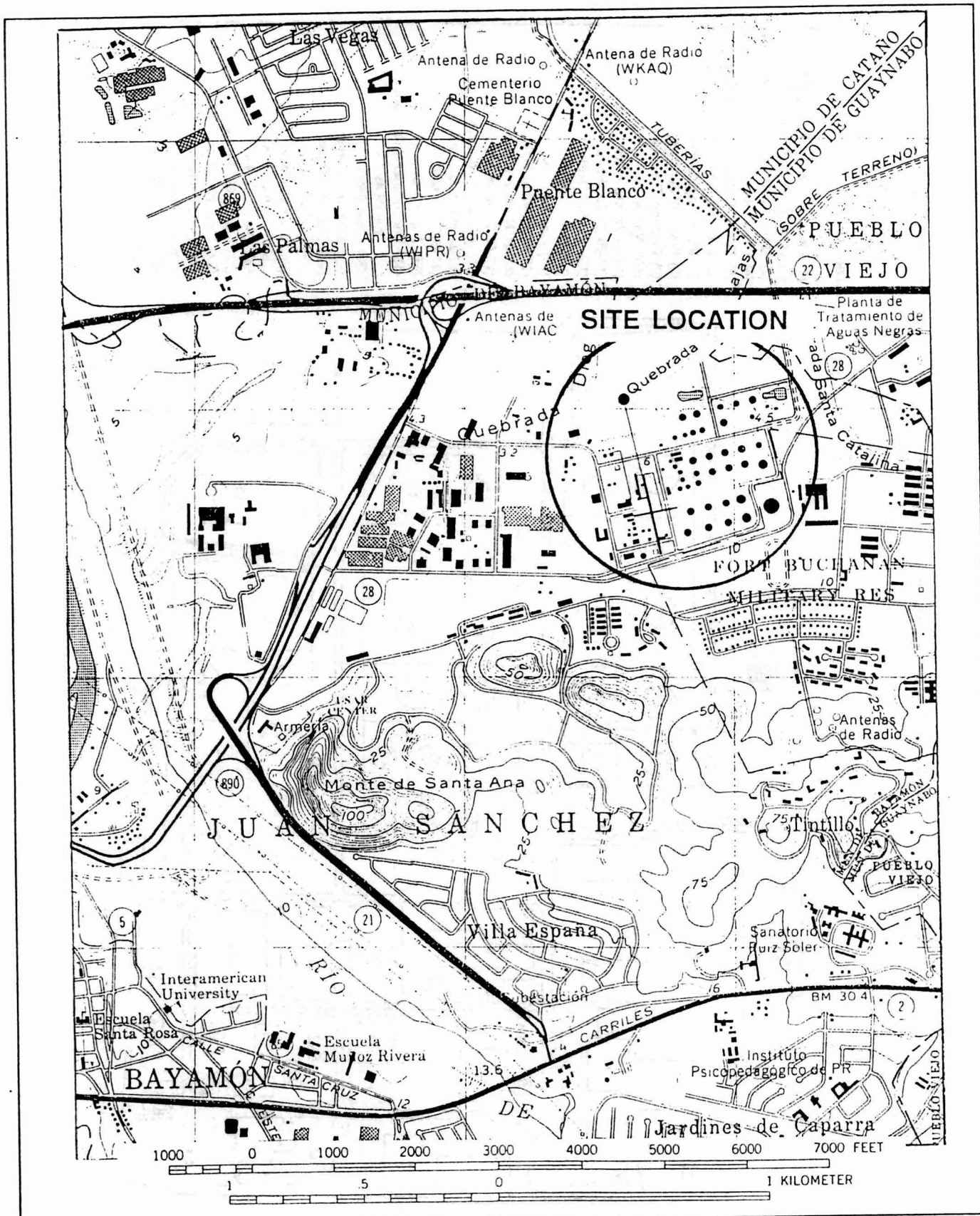
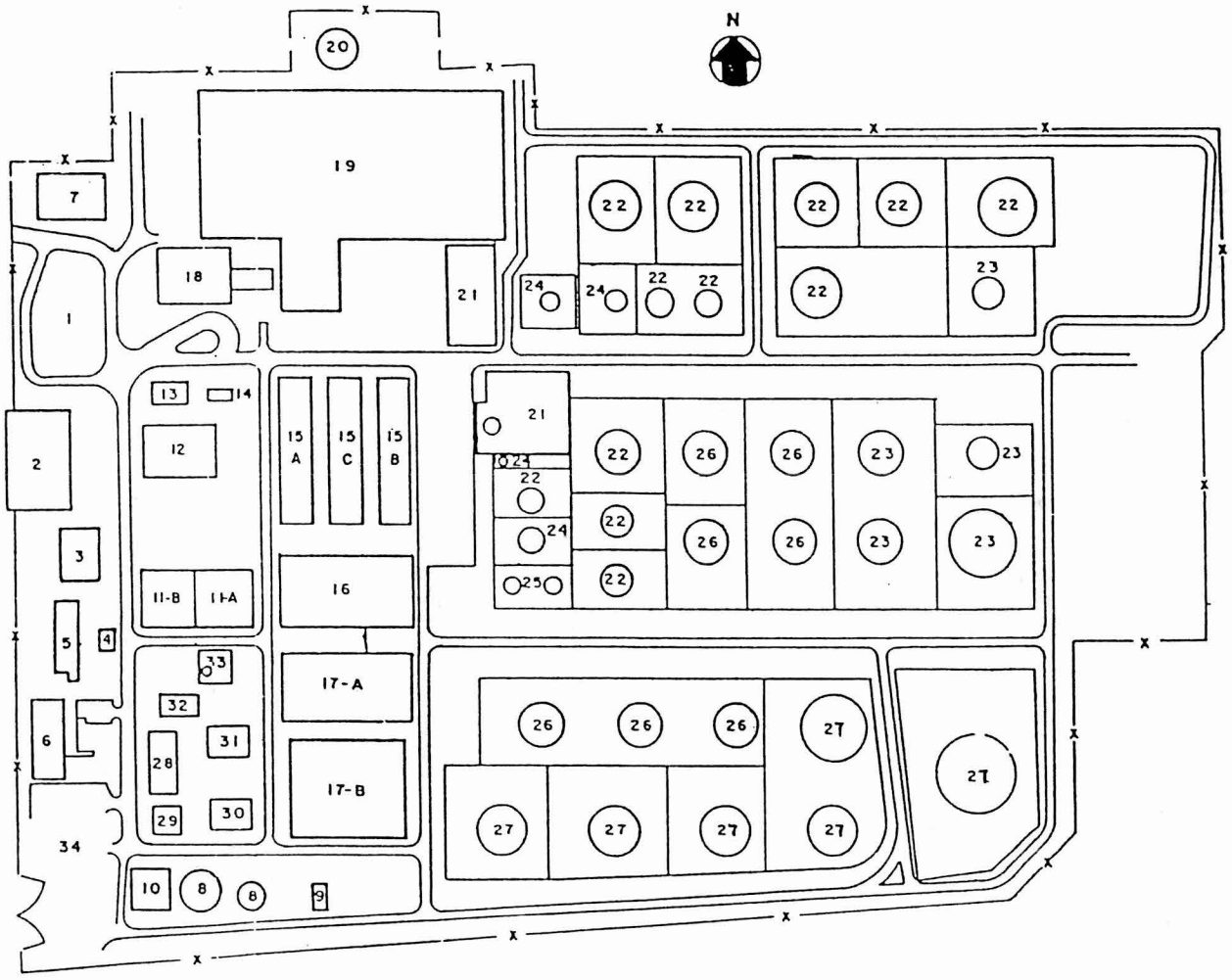


Figure 1.3

CPC Site Location Map, Bayamon, Puerto Rico



Legend

(1) Clean Product Loading Rack
(2) LPG Truck Loading Rack
(3) Maintenance Shop Building
(4) Fire House
(5) Power Distribution Building
(6) Office Building
(7) Marketing Office
(8) Fresh Water Supply
(9) Cooling Tower #1
(10) Warehouse
(11-A) Amine Plant
(11-B) Sulfur Plant
(12) Asphalt Tank
(13) Deep Well
(14) Cooling Tower #2
(15-A) Gulfiner Unit
(15-B) Naptha Pretreater Unit
(15-C) Platformer Unit
(16) No. 2 Crude Unit
(17-A) No. 1 Crude Unit
(17-B) FCC Unit
(18) Asphalt Unit
(19) Wastewater Treatment Facilities
(20) Flare Stock
(21) LPG Tanks Area
(22) Gasoline Tanks
(23) Fuel Oil Tanks
(24) Slop Oil Tank
(25) Kerosine Tanks
(26) Diesel Tanks
(27) Crude Oil Tanks
(28) Operation Field Office
(29) Dead Files
(30) Maintenance Shop
(31) Lunch Room
(32) Central Control Room
(33) Boiler Area
(34) Parking Area

Figure 1.4
CPC Facility Plot Plan

2. SECURITY PROCEDURES

The following information is being provided in accordance with 40 CFR 270.14(b)(4) and 264.14.

2.1 24-Hour Surveillance System

Caribbean Petroleum Corporation has developed security procedures to prevent unauthorized entry onto the plant site. Security at the plant is maintained by an organized 24-hour guard force which operates three 8-hour shifts per day, seven days per week. The security guard is composed of plant personnel and contractors who are specially trained for security responsibilities.

The guard staff monitors the site and the facility with cameras located throughout the plant perimeter. They have two-way radio communications to allow them to immediately respond to any emergency on the plant property. Procedures have been established to respond to plant emergencies such as bomb threats, fire, hurricanes, etc. Close relations are maintained with local police, fire and civil defense authorities.

2.2 Artificial Barriers

The entire CPC operating facility is surrounded by an eight foot high chain link fence. The Equalization Basin is located entirely within the fenced operating facility.

2.3 Controlled Entry/Egress Procedure

Guard staff monitor entry and exit through the main entrance to the plant. An additional entrance gate for product dispatching trucks and site contractors is also controlled by the guard staff. Figure 2.1 shows the location of the main and contractor's entrances. All visitors, employees, vendors, contractors, etc., must pass through the check points at the entrances before entering the property. Only people with identification badges are allowed to enter the facility. Visitors are required to obtain a visitor's badge at their entry point. Guards are stationed inside a guard house located near the entrance gates.

2.4 Warning Signs

Two warning signs located along the western edge of the Equalization Basin read: "DANGER - Hazardous Waste Storage Area - Unauthorized Personnel Keep Out." The signs are visible for 25 feet and are printed in English and Spanish.

Every 50 feet along the facility perimeter and at each gate, a black and white sign in English and Spanish is posted on the fence with the caption "Warning - Private Property - Do Not Enter" (Aviso - Propiedad Privada - No Entre"). The sign is visible from a distance of at least 25 feet.

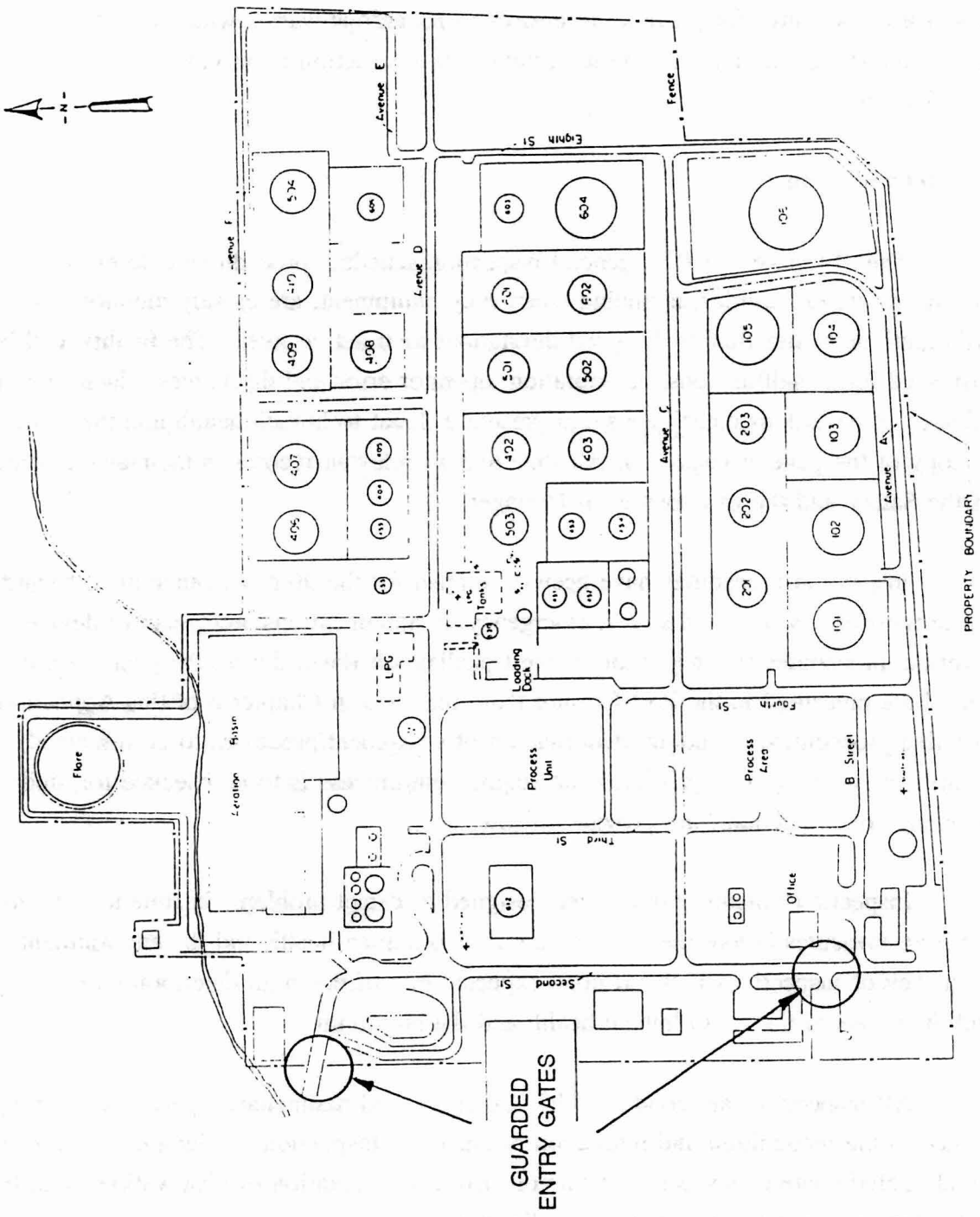


Figure 2.1

CPC Plot Plan Showing Facility Entrance Points

3. GENERAL INSPECTION SCHEDULE

Caribbean Petroleum Corporation has developed a general inspection schedule which describes procedures for preventing releases of hazardous wastes which may threaten human health and the environment. The information in this section is provided in accordance with 40 CFR 270.14(b)(5).

3.1 Introduction

The objective of CPC's general inspection schedule procedures is to ensure that all hazardous waste facilities, including emergency equipment, are closely monitored so that they will continue to function as designed throughout their active lives. The facility will be inspected form malfunctions, deterioration, operator error and discharges which may result in releases of hazardous constituents that present a threat to human health and the environment. A copy of the general inspection schedule and all relevant records is maintained at the office of the Safety and the Environmental Manager.

Inspection procedures have been developed for the 90-day storage area, hazardous waste transfer systems, and safety, emergency, communications, and security devices. In addition, procedures for inspection of the Equalization Basin during the post-closure care period are presented in the Post-Closure Plan, included in Chapter 6 of this Application. Detailed procedures, including identification of equipment/processes to be inspected, identification of types of problems each equipment/process is to be checked for, and frequency of inspections, are provided below.

Inspection schedules have been designed to detect problems in time to implement remedial measures before they present a threat to human health and the environment. The frequency of inspections is based upon expected rate of potential deterioration of equipment and the potential threats to human health and the environment.

All inspections are conducted by operations and maintenance personnel thoroughly trained in the recognition and mitigation of hazards. Inspection results are maintained in logs which include date of inspection, name of inspector, a notation of observations, and the date and nature of any repairs or other remedial measures.

Attachment B includes a number of the inspection logs utilized by plant personnel for the various inspection activities.

3.2 90-Day Storage Area

Although the 90-day container storage area is not subject to regulation as a treatment, storage, and disposal facility, CPC has developed inspection procedures that meet or exceed 40 CFR 264 requirements. Table 3.1 includes a list of items to be inspected, types of problems, and frequency of inspections.

3.3 Hazardous Waste Transfer Equipment

Hazardous waste is transferred through CPC's wastewater treatment system via a network of pipes and channels. At the request of EPA, CPC has developed inspection procedures to ensure that all pipelines and associated equipment used for the transfer of hazardous wastes are operating properly and do not pose a threat to human health or the environment. This transfer equipment includes all above ground equipment located between the CPI unit and the bioreactors. It is inspected because it handles a hazardous waste (D018). However, this equipment is not part of a RCRA regulated unit and is not subject to 40 CFR 264/265 requirements. Table 3.2 includes a list of equipment to be inspected, types of problems, and frequency of inspections.

3.4 Emergency Equipment

All safety, emergency, and communications equipment maintained by CPC is inspected to ensure that it is operable and that an adequate inventory of supplies is maintained for emergency situations. Table 3.3 includes a list of items to be inspected, types of problems, and frequency of inspections.

Table 3.1

INSPECTION SCHEDULE - 90 DAY STORAGE AREA

ITEM	TYPE OF PROBLEM	FREQUENCY
Container Placement	Inadequate aisle space Labels not visible Unsafe stacking 90-day storage violations	Weekly Weekly Weekly Weekly
Labeling of Containers	Improper description Improper waste code No accumulation date	Weekly Weekly Weekly
Condition of Containers	Excessive corrosion Leakage Structural defects Open lids	Weekly Weekly Weekly Weekly
Base and Dikes	Cracks Spalling Erosion Settlement Standing Water	Weekly Weekly Weekly Weekly Weekly

Table 3.2

INSPECTION SCHEDULE - HAZARDOUS WASTE TRANSFER EQUIPMENT

ITEM	TYPE OF PROBLEM	FREQUENCY
Piping: 6″ - CPI to DAF 6″ - DAF Bypass 6″ - DAF to Bioreactor 6″ - DAF to CPI return	Leakage Breaks Cracks Corrosion	Weekly Weekly Weekly Weekly
Valves: CPI to DAF (4 valves) DAF to Bioreactor (1 valve) DAF Bypass (6 valves)	Leakage Seal integrity Corrosion	Weekly Weekly Weekly
Pumps: CPI Suction Pump #1 CPI Suction Pump #2	Leakage Seal integrity Breaks/cracks in lines	Weekly Weekly Weekly
Pipe Supports	Corrosion Structural integrity	Weekly Weekly

Table 3.3

INSPECTION SCHEDULE -
EMERGENCY EQUIPMENT

ITEM	TYPE OF PROBLEM	FREQUENCY
Facility Fence	Damaged	Monthly
Gates and Locks	Sticking; Corrosion	Monthly
Warning Signs	Damaged; Missing	Monthly
Spill Control Equipment - Absorbent - Spill socks - Spill pillows	 Inadequate inventory Inadequate inventory Inadequate inventory	 Weekly Weekly Weekly
Personal Protective Equipment - Tyvek suits - Latex gloves	 Inadequate inventory Inadequate inventory	 Weekly Weekly
Telephone	Inoperable	Daily
Two-way radio	Power failure	Daily

4. PREPAREDNESS AND PREVENTION

CPC's facility is designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to the air, soil, surface water or groundwater that could threaten human health or the environment. The following information on CPC's preparedness and prevention program is being provided in accordance with 40 CFR 270.14(b)(6).

4.1 Internal and External Communications

CPC's facility is equipped with an internal communication system consisting of telephones, alarms, and two-way radios. Equipment is readily accessible to all facility personnel and is capable of summoning emergency assistance and of providing emergency instructions. The internal communication system consists of the following components:

Telephone - Telephones are located at various locations throughout CPC's facility. Telephones are accessible to all appropriate facility personnel and may be used to summon on-site or off-site assistance.

Alarms - Several process units and tanks are equipped with audible alarms to alert personnel to dangerous conditions. All personnel are trained in recognition and proper response to each alarm. In addition, ambient air monitoring stations are equipped with alarms to warn personnel of potentially dangerous conditions.

Two-way Radios - The foreman of each work crew carries a two-way radio which would be utilized to summon assistance in case of any emergency situation. In addition, personnel working alone in remote parts of the facility are required to carry two-way radios if activities pose a potential threat to human health. When working at the Equalization Basin, two-way radio is the means of communication available to facility personnel.

CPC's external communication system consists of telephones and an alarm system connected directly to the local fire department.

An operator is stationed at the wastewater treatment plant 24 hours a day (three 8-hour shifts). The nearest telephone is located in the operator's shack (noted on Figure 4.1 as the location of respirator/personal protection equipment). However, the operator carries a two-way radio whenever he leaves the shack. In the event of an emergency, the operator will notify his foreman using his two-way radio. Since all operators at the site also have a radio, and since all radios are tuned to the same frequency, all personnel will be alerted to the hazard, including the emergency coordinator. If appropriate, facility alarms will be sounded which are audible to all personnel.

The shift operator at the wastewater treatment plant is not responsible for communications with outside authorities. This responsibility lies with the emergency coordinator or his designee. Communication will then take place using CPC's telephone system.

4.2 Emergency Equipment

CPC maintains fire control, spill control, and decontamination equipment at several locations throughout the facility. The equipment is strategically located so that it is readily accessible to all personnel. The location of this equipment in the vicinity of the Equalization Basin is shown in Figure 4.1. Decontamination equipment is maintained at the facility's dispensary, located at the firehouse. A description of the equipment is provided below.

Fire Protection Equipment

Water is provided for process use as well as emergency response activities. CPC is serviced by the municipal water supply as well as on-site groundwater extraction wells. Capacity of the water supply system is 4000 gallons per minute, using two 2000 gpm pumps. Constant pressure is maintained between 50 and 65 psi. Adequate water pressure for the response to emergencies is maintained at all times.

Fire Water Supply - CPC is equipped with a network of fire water mains which provide adequate water for responding to fires to all parts of the facility. This network provides CPC with its first line of defense in fighting fires and supplies the plant with its primary means of extinguishment.

Water is pumped from the main water storage tanks at adequate pressure to fully operate all response equipment, including pumps, hoses, and sprinklers. Fire pumps are inspected routinely and are operated automatically if sprinkler systems go off or if hydrants are opened.

Automatic sprinklers are provided at all major buildings and process areas. Fire hydrants are connected to the fire main at various points throughout the plant. These stations are equipped with hose boxes and foam stations. The location of fire control facilities, including pipes, hydrants, pumps, etc., is provided in Attachment C.

Emergency Brigade - CPC maintains its own emergency brigade for response to fires, explosions, and other emergencies. CPC's firehouse is located adjacent to the process area. The brigade consists of full time staff and two fire engines on alert 24 hours a day. Fire engines are inspected daily for oil, battery charge, water, and fuel. Each engine is run for 15 minutes per day.

The emergency brigade is also responsible for maintaining other firefighting equipment, including fire extinguishers, foam stations, etc. The firehouse acts as a storage and service area for various firefighting equipment, including fire blankets, breathing apparatus, etc.

Fire Extinguishers - Fire extinguishers are strategically located throughout the facility and are readily accessible to all personnel in the event of a fire. Extinguishers are routinely inspected for expiration, charge, damage, etc.

Spill Control Equipment

CPC maintains all necessary supplies and equipment required to respond to and clean up spills of hazardous wastes and other hazardous substances.

At CPC's terminal on San Juan Bay, an oil containment boom and ancillary equipment are maintained in the event of a release of crude oil or products to surface waters. In addition, an oil skimming device is maintained at the refinery for mobilization in the event of a surface water spill.

CPC owns and operates two vacuum trucks. The trucks are housed in CPC's maintenance building. These trucks are routinely used by CPC for transfer of materials throughout the site. The trucks are also important components of CPC's spill response capacity. In the event of a release of hazardous waste or other hazardous materials to land surface, the trucks will be deployed and, if appropriate, used for collection of spilled material and transfer to a suitable storage area.

CPC maintains a supply of absorbent materials at various locations throughout the site. These absorbent materials, including spill pillows, booms, and loose materials are used to contain and clean up spills throughout the site. Areas where these materials are stored include the firehouse, the maintenance buildings, the warehouse, and various locations throughout the process area, tank farm, and wastewater treatment plant. The warehouse is in close proximity to both the Equalization Basin and the 90-day storage area and would be the source of absorbent materials in the event of a release at either location. In addition, several CPC vehicles are stocked with spill response equipment during normal course of operations.

Spill control materials are also maintained in a shed adjacent to the wastewater treatment operator's office. These materials will be used in the immediate response to a spill at the Equalization basin. Materials include approximately ten bags of loose absorbent material, three boxes of absorbent spill pillows, and two boxes of spill socks. These materials will be supplemented by materials stored in other areas of the refinery, if necessary.

Decontamination Equipment

Decontamination equipment to be used in the event of a spill is maintained at various locations throughout the CPC facility. Steamcleaning equipment is stored at the maintenance area. High pressure water wash equipment is stored at the firehouse. Personnel decontamination material such as soap and detergents is stored at the dispensary, which is located within the firehouse. Chemicals used for decontamination of equipment such as sampling devices, including hexane and acetone, is stored in CPC's laboratory. Additional supplies of these materials are also stored in CPC's warehouse.

All emergency response equipment is properly inspected, tested and maintained.

4.3 Aisle Space

Adequate aisle space is provided at the 90-day hazardous waste storage area to ensure that anticipated emergency response equipment can gain access to all areas. Roads in the vicinity of the Equalization Basin, and throughout the entire plant, are designed to allow easy access by firetrucks, ambulances, and other emergency vehicles.

4.4 Arrangements with Local Authorities

CPC has informed appropriate outside authorities about the types and hazardous properties of the hazardous materials that are handled at the facility and has provided these authorities with copies of the Contingency Plan. A description of these arrangements is included below.

Several arrangements have been made with local authorities. The city fire department conducts yearly visits of the facility including its hazardous waste storage area. All local emergency response efforts are coordinated through the police and fire departments. A copy of CPC's SPCC Plan has been forwarded to the fire and police departments, the local emergency planning committee, and the State Emergency Response Center's regional office has been given a copy of the plan for use as a part of the community's emergency plans.

The services of the following cleanup and spill control contractors may be utilized if needed to handle spills from the hazardous waste storage area:

1. CROWLEY ENVIRONMENTAL SERVICES
2. PROTECO
3. CLEAR AMBIENT SERVICE CO.
4. BROWNING FERRIS INDUSTRIES
5. EASTERN CHEMICAL WASTE SYSTEMS

The Plant Emergency Brigade is the first responder to any fire within the refinery. However, once the Municipal Fire Department comes to the plant, they will take control over the emergency. The Plant Emergency Brigade will then act as a back up for them.

Representatives from the local hospital toured the complete facility in late 1992. Additional tour visits will be conducted in the future. Copies of applicable Material Safety Data Sheets and the SPCC Plan have been forwarded to the local hospital and emergency planning committee.

5. SEISMIC AND FLOODPLAIN INFORMATION

The following information is being provided in accordance with 40 CFR 270.14(b)(11)(i) and (iii).

5.1 Seismic Standard

Because Puerto Rico is not listed in Appendix VI of 40 CFR Part 264, the seismic standard does not apply.

5.2 Floodplain

CPC's Equalization Basin is located outside of the 100-year floodplain according to the Federal Insurance Agency (FIA) flood map for the area. A section of the FIA flood map showing the location of the CPC facility in relation to the 100-year floodplain is shown in Figure 5.1. The full-scale FIA map showing the location of the CPC facility is included as Attachment D.

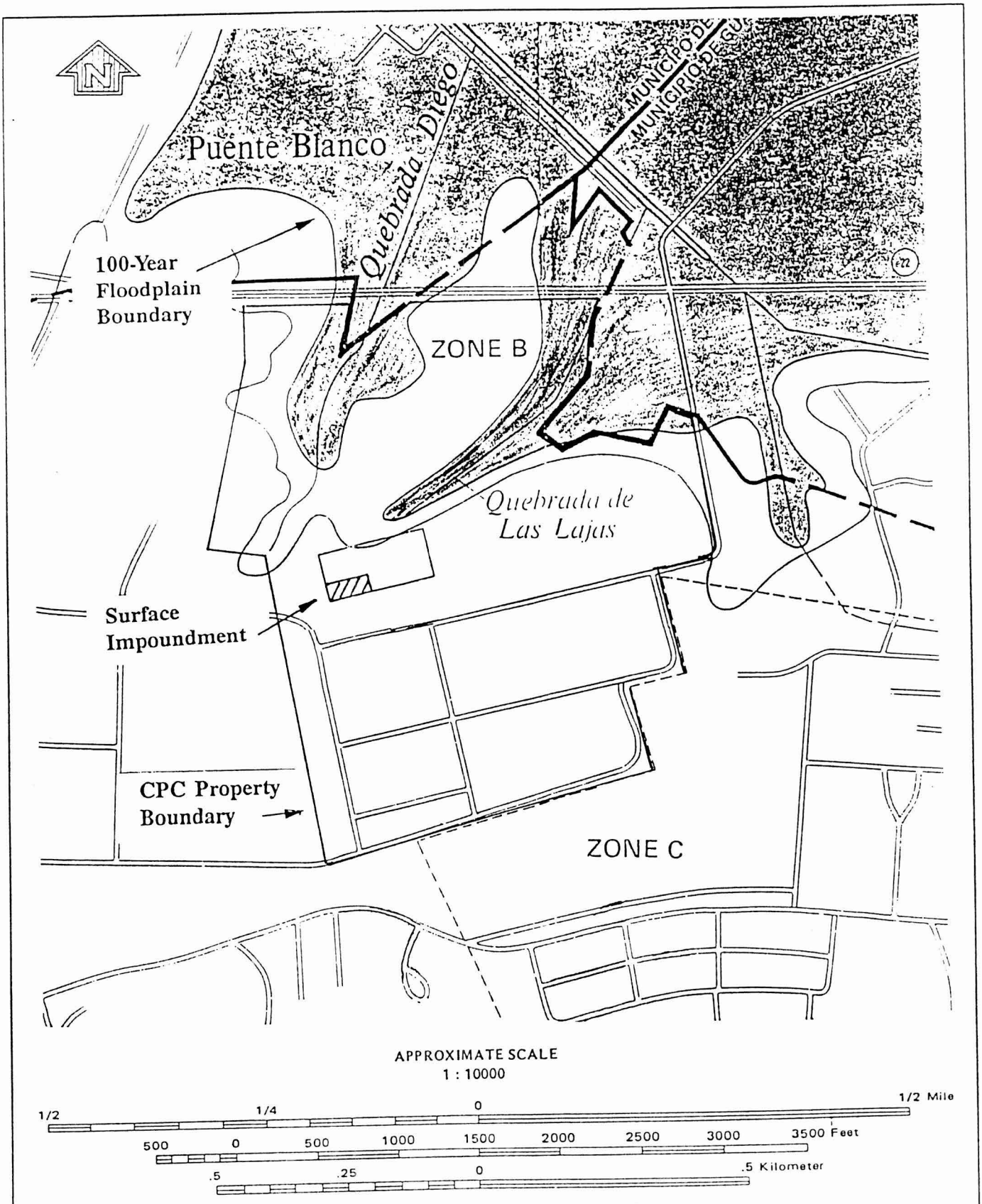


Figure 5.1

CPC Facility in Relation to 100-Year Floodplain

6. POST-CLOSURE PLAN

CPC has developed a Post-Closure Plan for the Equalization Basin in accordance with the requirements of 40 CFR 270.14(b)(13), 265 Subpart G, and 265.228. A copy of the Post-Closure Plan is presented in Attachment E.

7. POST-CLOSURE NOTICES

Information in this section on post-closure notices is provided in accordance with 40 CFR 270.14(b)(14) and 264.119.

No later than 60 days after certification of closure of the Equalization Basin, CPC will submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the Regional Administrator a record of the type, location and quantity of hazardous waste, if any, disposed within the unit as required by 40 CFR 264.119(a).

Within 60 days of certification of the closure of the Equalization Basin, CPC will record, in accordance with Commonwealth law, a notation on the deed to the facility property (or other suitable instrument) that will in perpetuity notify any potential purchaser of the property that the land was used to manage hazardous waste, that its use is restricted under 40 CFR 264 Subpart G regulations, and that required information has been filed with the local zoning board, in accordance with 40 CFR 264.119(b). A certification will be submitted to the Regional Administrator that the notation described above has been recorded as required. A copy of the document in which the notation has been placed will also be submitted to the Regional Administrator.

As required by 40 CFR 264.119(c), if CPC wishes to remove hazardous waste residues or contaminated soils from the unit at a future date, CPC will request a modification to the post-closure permit in accordance with the terms of 40 CFR 124 and 270.

As required by 40 CFR 264.120, within 60 days of completion of the post-closure care period, CPC will submit to the Regional Administrator a certification that the post-closure care period was performed in accordance with the specifications in the approved Post-Closure Plan. The certification will be signed by CPC and by an independent registered professional engineer.

8. POST-CLOSURE COST ESTIMATE AND FINANCIAL ASSURANCE

CPC has developed a cost estimate for post-closure care of the Equalization Basin in accordance with 40 CFR 270.14(b)(16). A detailed cost estimate for post-closure care is presented in Attachment F.

The cost estimate was prepared in accordance with guidance presented in "Guidance Manual: Cost Estimates for Closure and Post-Closure Plans" (OSWER Policy Directive #9476.00-6). The cost estimate will be adjusted annually to account for inflation pursuant to 40 CFR 264.144(b). Specific issues relating to preparation of the cost estimate are discussed below:

- The post-closure cost estimate is based on the cost to CPC of hiring a third party to conduct post-closure care activities.

- Costs have been updated through the third quarter of 1994, as required, using the Implicit Price Deflator for Gross National Product.

In accordance with 40 CFR 265.145, CPC is required to establish financial assurance for post-closure care of the Equalization Basin. In order to comply with this provision, CPC has elected to use a post-closure insurance policy in accordance with 40 CFR 265.145(e). A copy of the instrument is presented in Attachment G. The insurance policy is currently being revised to reflect the updated cost estimate and will be forwarded to EPA under separate cover.

9. TOPOGRAPHIC MAP

The following information regarding topographic features is being provided in accordance with 40 CFR 270.14(b)(19).

9.1 General Site Map

Attachment H is a copy of an aerial photograph of the CPC facility and surroundings. The scale of the photo is approximately 1:20,000; the flight date is 3 April 1990. Attachment I is the USGS 7.5 minute, 1:20,000 scale Bayamon quadrangle map that encompasses the CPC facility area. The map was originally developed in 1969 and was photorevised in 1982. Attachment J is an enlarged copy of the USGS topographic map at a scale of 1:2400 (1 inch = 200 feet) showing the CPC facility and a border greater than 1000 feet around the facility. The topographic contour interval for this map is 1 meter (3.3 feet). No aerial photogrammetric surveys are available for the area that give a more detailed topographic contour interval.

Attachment A, referenced in Chapter 1, is a large scale plot plan of the CPC facility showing the location of waste treatment areas, process areas, storage tanks, and office areas. The map was developed in 1987. Figure 9.1 is a small scale version of this plot plan presented for easier viewing.

The topographic map of Attachment I and plot plan of Attachment A provide the following information:

* Map scale and date.
* Surface waters, including intermittent streams.
* North orientation.
* Legal boundaries of the CPC facility.
* Access and internal roads.
* Location of the buildings and other structures.
* Location of hazardous waste storage/treatment facilities.
* Contour interval of one meter (about 3 feet).

9.2 100-year Floodplain Area

A section of the floodplain map in the vicinity of the CPC facility is presented in Chapter 5, Figure 5.1. The full-size floodplain map is presented in Attachment D. The boundary of the 100-year floodplain area is shown on the map in relation to the CPC facility. The map shows that the surface impoundment at the CPC facility is situated outside of the 100-year floodplain.

9.3 Surface Waters

The surface waters at the CPC facility consist of surface impoundments, streams (quebradas), and drainage ditches. The major drainage of the CPC facility is to the north. Storm water from the facility drains into Quebrada de Las Lajas. Surface waters within the facility are illustrated in the USGS map in Attachment I. Average annual rainfall is approximately 60 inches (Climate of the States, Vol. 2, NOAA, 1975).

9.4 Wind Rose and General Meteorology

Wind rose data for the area, as required by 40 CFR 270.14(b)(19)(v), is included in Figures 9.2, 9.3 and 9.4. The exact dates covered by the wind roses are not known but were developed from recent data. The wind rose is from Isla Verde Airport, San Juan, which is the closest point where such information is available. Isla Verde Airport is about 9 miles east of the CPC facility.

Easterly trade winds predominate which are modified by local land and sea breezes and island topography. Differential heating of the land and the sea during the day tends to give wind predominantly off the ocean. In the evening the wind usually shifts to the south or southeast.

The normal annual temperature for the area averages about 80° F (26° C). The annual temperature range between the coldest and warmest months is small with an approximate 5 to 6° F difference.

The average annual rainfall in the San Juan area is approximately 60 inches (Climates of the States, NOAA, 1975). Rain showers occur mostly in the afternoon and evening. Evening rain showers are a characteristic rainfall feature of the San Juan area. Continuous rainfall may occur as a result of tropical disturbances when the trailing edge of a cold front from the United States reaches Puerto Rico.

Although Puerto Rico is in a tropical hurricane region of the eastern Caribbean, only a few hurricanes have passed close enough to San Juan to have caused damage. The hurricane season is usually from June through November.

9.5 Surrounding Land Use

Surrounding land use is illustrated in the USGS map presented in Attachment I. In addition, surrounding land use information is provided in Figure 9.5 in the form of a composite zoning map based on "Bayamon Zoning Maps" developed by the Puerto Rico Planning Board.

9.6 Hazardous Waste Management Unit Boundary

Attachment J shows the legal boundary of the CPC facility and the boundary of the hazardous waste surface impoundment.

9.7 Access Control and Internal Roads

Access to the CPC facility is controlled by two gates with 24-hour guards. All employees and visitors must pass through these gates prior to entry. The two gates are shown in Figure 2.1.

9.8 Injection and Withdrawal Wells

The CPC facility has no injection wells. Two wells are located on site that are used for general water supply. Attachment A shows them as the North Well and the South Well. The North Well is located near the west-central border of the CPC facility; the South Well is located in the southwest area of the CPC facility.

Five product recovery wells, wells P1 to P5, are also located with the CPC facility. Their location is shown in Attachment A.

9.9 Drainage and Flood Control Barriers

No drainage or flood control barriers are present on the CPC facility because it is not in the 100-year floodplain.

9.10 Runoff Control/Storm Water Collection Systems

CPC's run-off control systems consists of a series of ditches, swales, channels, pipes, etc., located throughout the facility. A schematic of this system is presented in Attachment K.

9.11 Fire Control Facilities

The location of fire control facilities, including pipes, hydrants, pumps, etc., is provided in Attachment C.

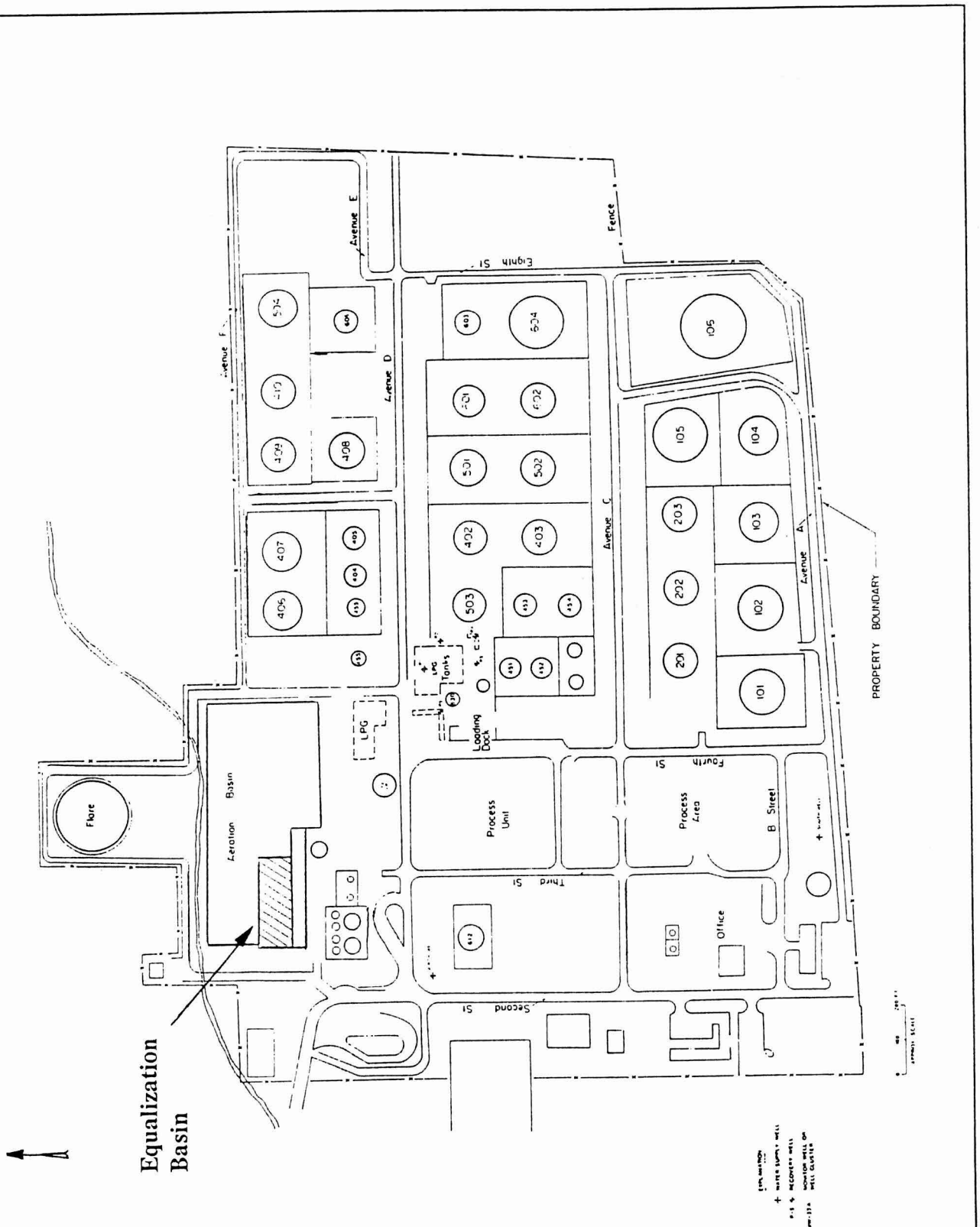


Figure 9.1

Plot Plan of CPC Facility (small scale)

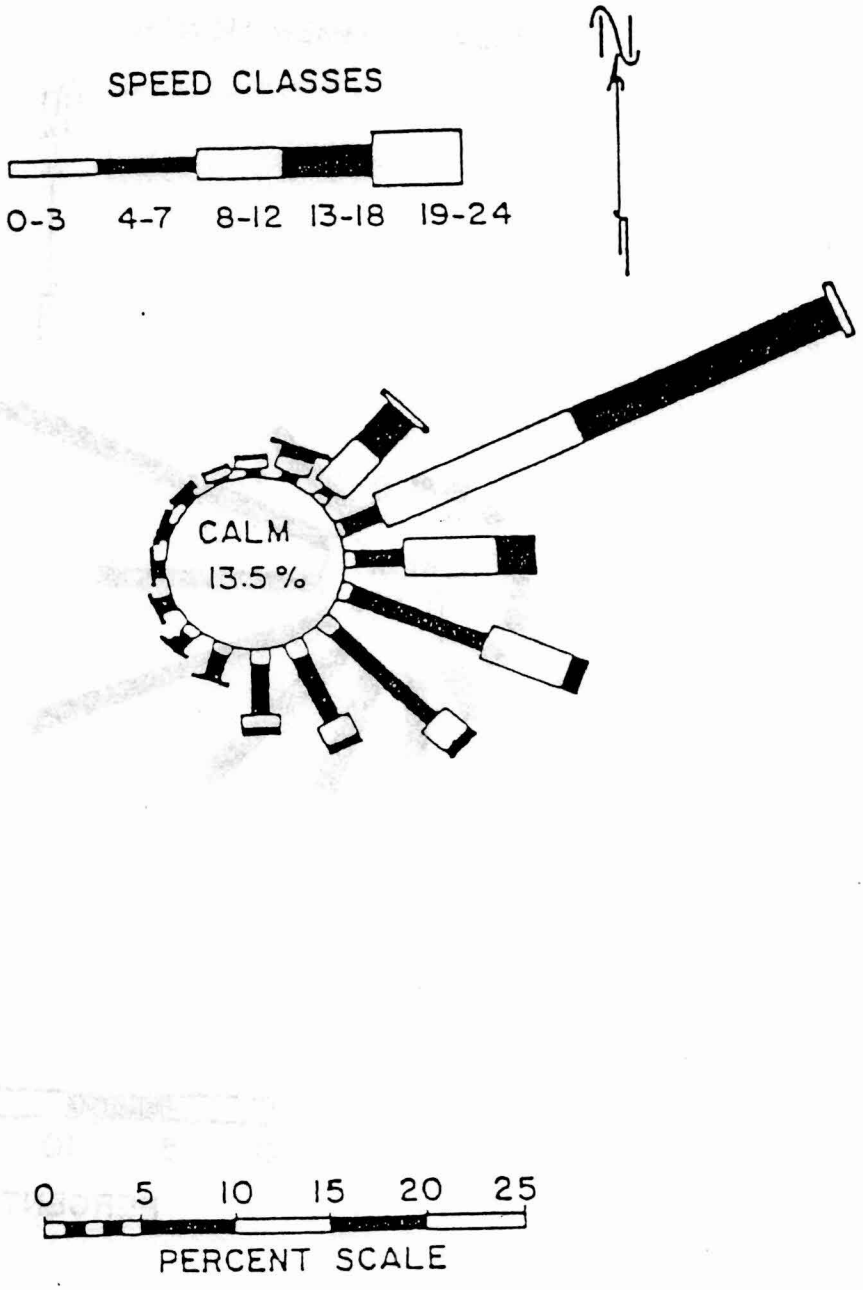


Figure 9-2

Wind Rose for North Coast Showing Speed and Direction

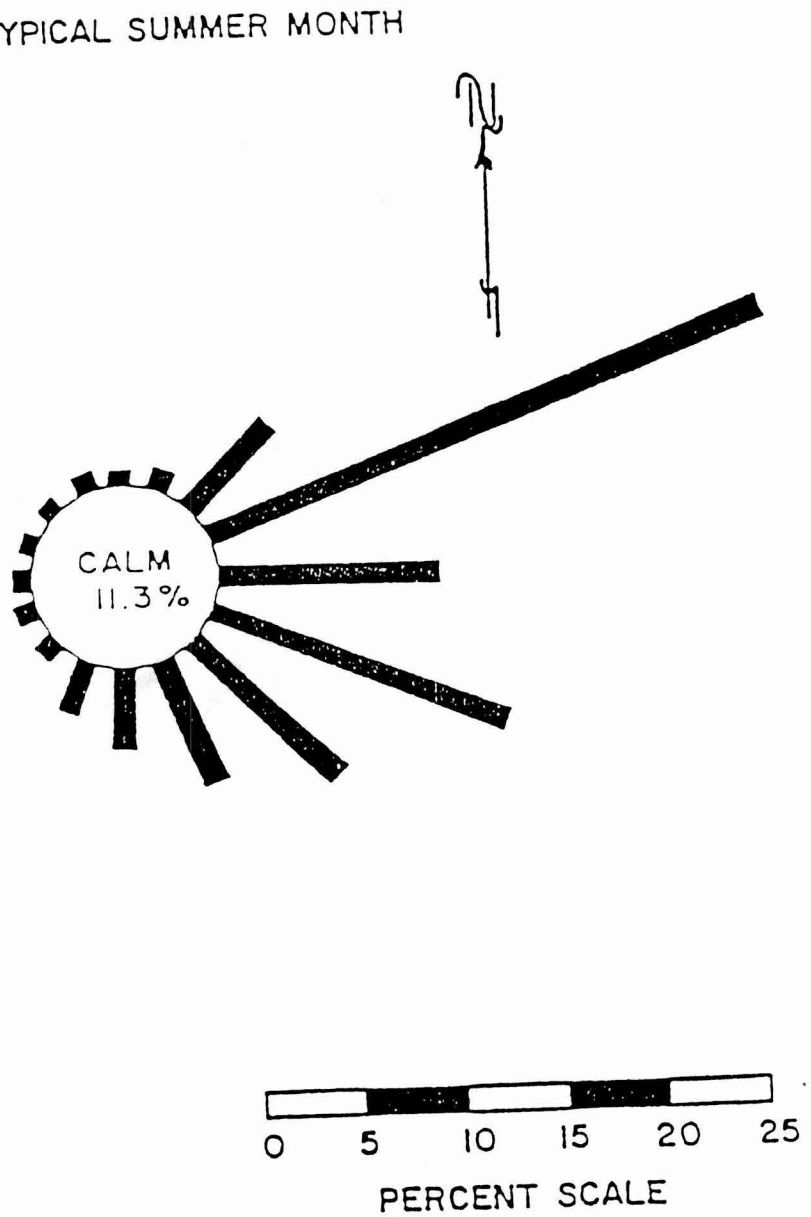


Figure 9-3

Wind Rose-Direction Frequency Distribution for North Coast (Summer)

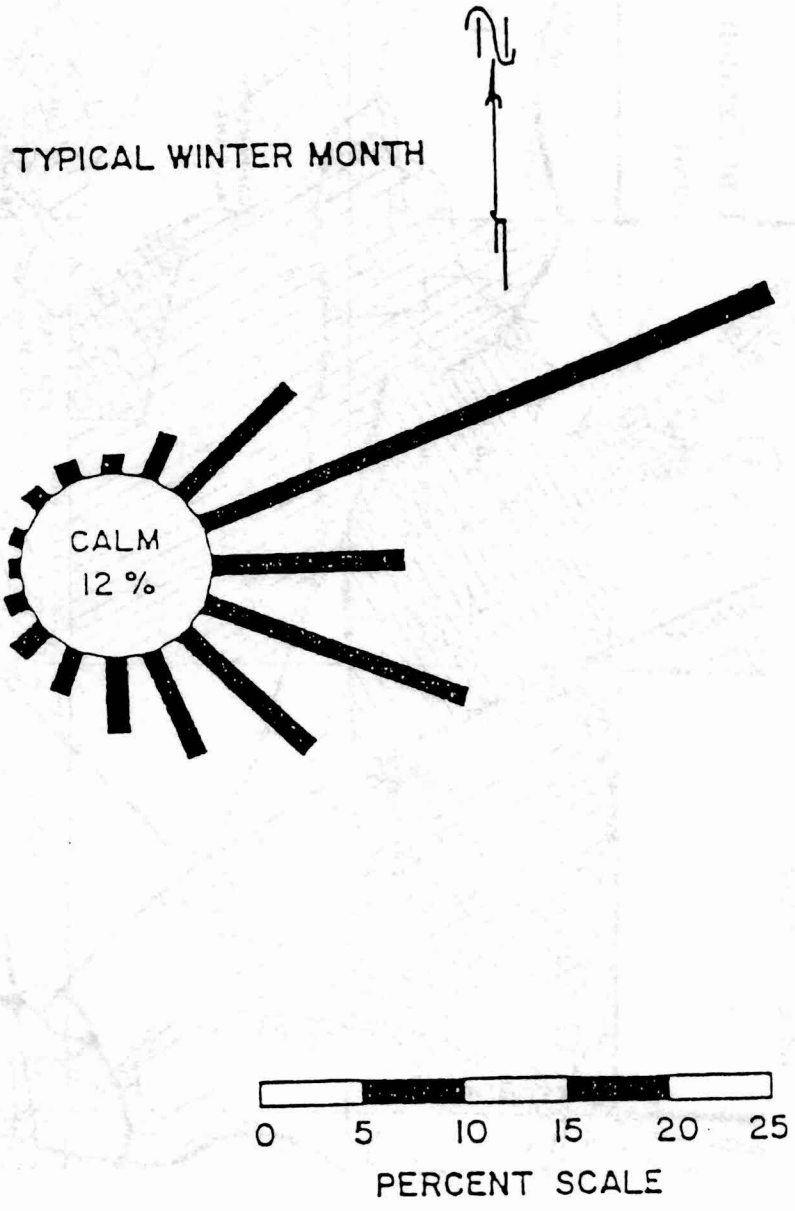


Figure 9-4

Wind Rose-Direction Frequency Distribution for North Coast (Winter)

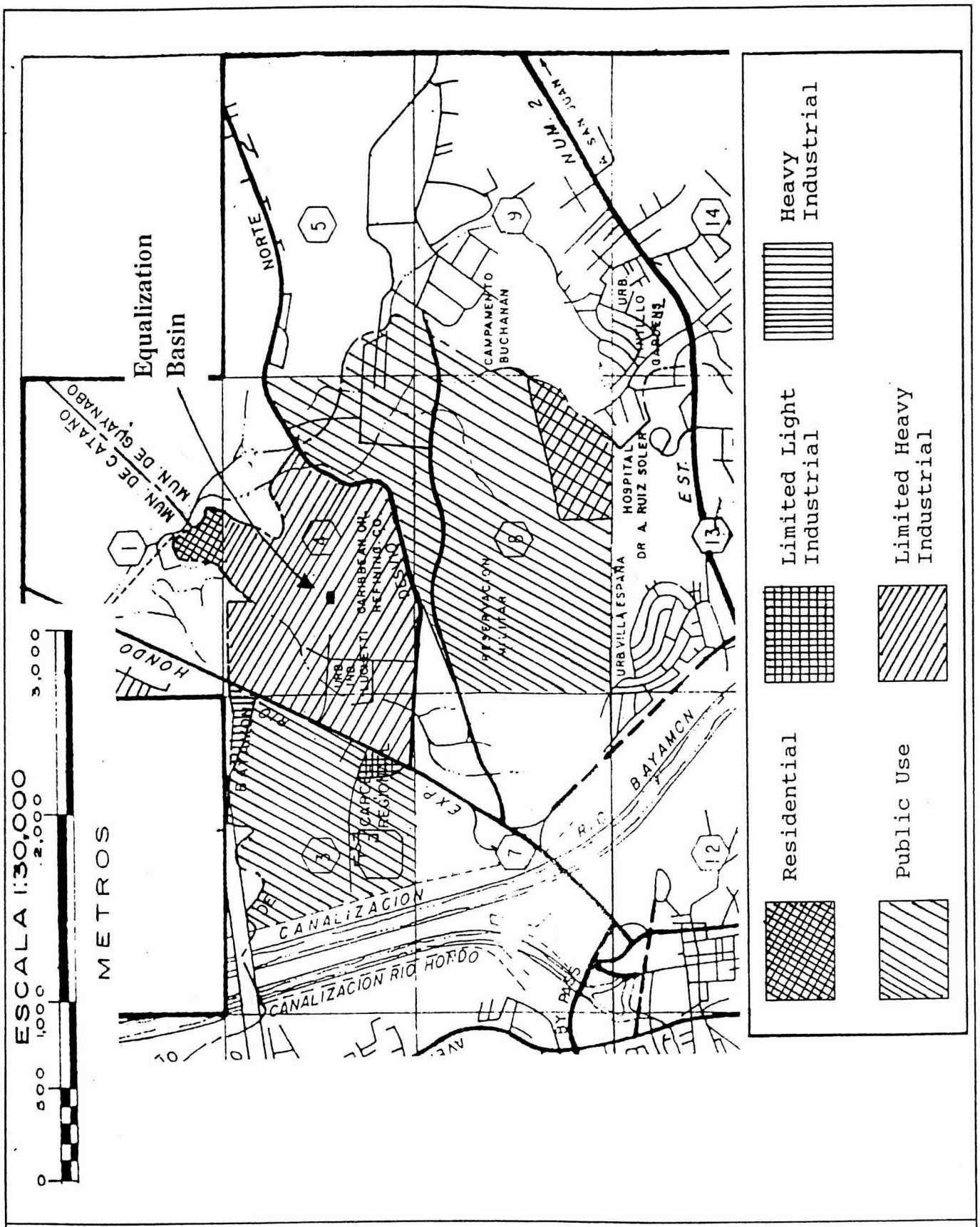


Figure 9-5

Zoning Map for the Area Surrounding the CPC Facility
(Data Source: Puerto Rico Planning Board zoning map of Bayamon, 1991)

10. PROTECTION OF GROUNDWATER

This section presents a discussion of existing groundwater monitoring data at the CPC Equalization Basin and a description of the proposed post-closure groundwater monitoring system for the Basin. The information in this section is presented in accordance with 40 CFR 270.14(c).

10.1 Summary of Groundwater Monitoring Data

A brief summary of groundwater sampling results for the Equalization Basin obtained during interim status monitoring is presented in this section. Detailed groundwater sampling data have been previously presented to EPA in annual groundwater monitoring and quarterly groundwater quality assessment program reports. A listing of these groundwater reports is presented below:

Reference	Title
1	Annual Groundwater Monitoring Report, 1991
2	Annual Groundwater Monitoring Report, 1992
3	Annual Groundwater Monitoring Report, 1993
4	Groundwater Quality Assessment Plan Results, January 1994
5	Groundwater Quality Assessment Plan Results, March 1994
6	Groundwater Quality Assessment Plan Results, July 1994
7	Groundwater Quality Assessment Plan Results, October 1994 (will be submitted to EPA in December 1994)

CPC established background concentration values for groundwater indicator parameters (specific conductivity, pH, TOC, TOX) during the first four quarters of interim status detection monitoring in 1991 and 1992 (references 1, 2 and 3). Comparison with background values of results from the succeeding sampling event indicated a statistically significant difference in specific conductivity. As a result, CPC implemented a groundwater quality assessment program in August 1993.

Results from the groundwater quality assessment program (references 4 through 7) indicated the presence of benzene at upgradient well EB-103. On October 1994, the benzene

concentration was 120 ug/l. The benzene is interpreted to be from an external source west of the Equalization Basin, rather than from the Equalization Basin. This interpretation is based on groundwater flow information and the absence of benzene contamination at adjacent monitoring wells (EB-102 and EB-104). During the Corrective Action Program at the facility, the source of the benzene, which is interpreted to be external to the Equalization Basin, will be investigated.

Also, during the initial quarterly monitoring in 1991 and 1992 (references 1 and 2), several Appendix III constituents were detected at several of the wells at concentrations above maximum contaminant levels (arsenic, chromium, mercury, lead, radium, and gross alpha). The detections were not consistent from quarter to quarter and several constituents were detected only once. Laboratory or field QA/QC problems appear to have adversely affected the data and may have caused false positive data.

Groundwater samples from two sampling events in 1993 were analyzed for Modified Skinner List (MSL) metals (references 3 and 4). (A list of MSL metals is presented in Table 2 of the Post Closure Plan of Attachment E). More sensitive SW-846 analytical methods and a more strict laboratory QA/QC by a New Jersey certified laboratory were used for the MSL analysis during the two sampling events. No metals above MCLs were detected with the exception of antimony at one well.

CPC proposes to include analyses for Modified Skinner list metals during the first four quarterly sampling events for the area-wide groundwater monitoring program described in Section 10.5. The quarterly sampling will provide a definitive set of background groundwater data for Equalization Basin and waste water treatment area.

10.2 Aquifer Identification

A brief summary of the geology and hydrogeology, including the uppermost aquifer, is presented below. A detailed description of the geology and hydrogeology at the CPC facility

has been presented in previous submittals to EPA for the Equalization Basin. These submittals include the following:

RCRA Part B Permit Application, September 1991
RCRA Part B Permit Application Addendum, October 1992
Response to RCRA §3007 Information Request, June 1993

The geology at the CPC facility is composed of three general units: a surface fill, a clayey sediment overburden and a limestone. The surface fill and clayey sediment overburden have a combined thickness ranging from 10 feet at the southern perimeter of the facility to 90 feet on the northern perimeter. The uppermost aquifer is located within the clayey sediment overburden.

The surface fill overburden consists of material derived from terracing in the tank farm area and construction of underground utilities. Fill thickness varies from 0.3 to 4.0 feet with an average thickness of 2.5 feet; it is composed predominantly of silty clay with varying amounts of sand and small stones. Limestone, volcanic rock fragments, and construction debris are also found in the surface fill.

The clayey sediment overburden, in which the uppermost aquifer occurs, consists predominantly of clay with varying amounts of silt and sand which are present as layers, seams, lenses, and partings, as well as within the clay matrix.

The contact between the limestone and overlying clayey sediment is generally gradational. The gradational zone is predominantly composed of an upper clastic clay and a lower calcareous clay. According to drilling results from other areas of the facility the thickness of the gradational zone ranges from 0.5 to 2.0 feet.

Conclusions derived during installation of the existing groundwater monitoring network at the Equalization Basin indicate that the upper aquifer in the local vicinity of the Equalization Basin is confined to semi-confined. Drilling evidence from other areas of the facility suggest that the uppermost aquifer is unconfined. Significant heterogeneity in the clayey sediment overburden and uppermost aquifer is also indicated from the drilling results.

Slug test results from well EB-102 at the Equalization Basin shows that the hydraulic conductivity of the uppermost aquifer is about 0.095 ft/d (3.3×10^{-5} cm/sec). This result is similar to slug test results observed in other areas of the CPC facility.

The underlying limestone is a confined aquifer with a flow direction generally toward the north. According to water level differences in clustered monitoring wells in other areas of the facility, the vertical direction of groundwater flow is downward. The amount of downward flow, however, is interpreted to be negligible because of the very low permeability of the clayey sediment separating the two aquifers.

Groundwater Elevation, Flow Rate and Direction

Figure 10-1 presents a groundwater level contour and flow direction map at the CPC Equalization Basin for the uppermost aquifer. Groundwater levels are observed to range from about 2 to 8 feet above mean sea level. The flow direction is interpreted to be from the south and west. The flow map indicates that wells EB-101, EB-103, and EB-112 are upgradient of the Equalization Basin and that wells EB-109, EB-110A, and EB-111 are downgradient.

Groundwater velocities are estimated to range from 1.6 ft/yr to 8.6 ft/yr based on hydraulic conductivity and historical water level difference data. The range in velocity estimates indicates the heterogeneity of the uppermost aquifer.

10.3 Topographic Map

A delineation of the waste management area, the property boundary, the proposed point of compliance for the alternate groundwater monitoring system, and the proposed location of groundwater monitoring wells are shown on the map of Attachment J. The waste management area is shown by the boundary of the Equalization Basin. The proposed point of compliance is along a line joining the three downgradient wells EB-109, EB-110A, and EB-111. The groundwater flow direction based on groundwater level measurements at the Equalization Basin is also shown. Since the uppermost aquifer is ubiquitous throughout the area of the Equalization Basin it is not shown on the map.

10.4 Contaminant Plumes

It is interpreted from the results of the groundwater quality assessment program that the benzene contamination at well EB-103 is from an external source west of the Equalization Basin, rather than from the Equalization Basin. The approximate delineation of the benzene plume is presented in Figure 10-2. Since the plume is not interpreted to have entered the groundwater from the Equalization Basin, it is not included on the map of Attachment J.

10.5 Proposed Groundwater Monitoring Program

An area-wide groundwater investigation of the CPC wastewater treatment plant is proposed to be conducted as part of a Corrective Action Program at the CPC facility. The objective of the area-wide investigation is to characterize hydrogeological conditions in the general vicinity of the wastewater treatment plant, including the nature and extent of any groundwater contamination that may be occurring in the area. The area-wide investigation presented in Attachment L will address all relevant groundwater monitoring issues associated with the monitoring of the Equalization Basin. A component of the investigation is installation of a groundwater monitoring system for post-closure monitoring of the Equalization Basin.

The post-closure monitoring system will be designed to satisfy the requirements of 40 CFR 264.97 as well as the objectives of an area-wide corrective action program. Enhancements or changes to the proposed system may be developed based on the results of the ongoing interim status groundwater quality assessment program and after evaluation of results of the area-wide groundwater investigation of the wastewater treatment plant.

The proposed well locations for the monitoring system are presented in the Post-Closure Plan for the Equalization Basin which is presented as Attachment E. Also presented in the Plan are groundwater sampling parameters and frequency, and statistical testing for post-closure monitoring. The sampling and analysis plan to be used for the groundwater monitoring is presented as Attachment M.

10.6 Presence of Hazardous Constituents

It is interpreted that the source of benzene contamination at well EB-103 of the Equalization Basin is from a source west and external to the Equalization Basin. This contamination results in an upgradient impact to the Basin. As part of the area-wide monitoring program for the wastewater treatment plant, an additional well will be installed further west of the Equalization Basin to determine the source of benzene.

The proposed groundwater monitoring system is presented in the Post-Closure Plan for the Equalization Basin. Background concentration values for each monitoring parameter will be established during the first four quarterly sampling events at the monitoring system. Background concentrations will be established by averaging the values from the quarterly sampling. A list of representative indicator constituents will be determined after evaluation of the four quarterly sampling results for Modified Skinner List constituents. Groundwater levels will be measured during each sampling event. Also presented in the Post-Closure Plan is the proposed groundwater sampling frequency, and statistical testing for post-closure monitoring.

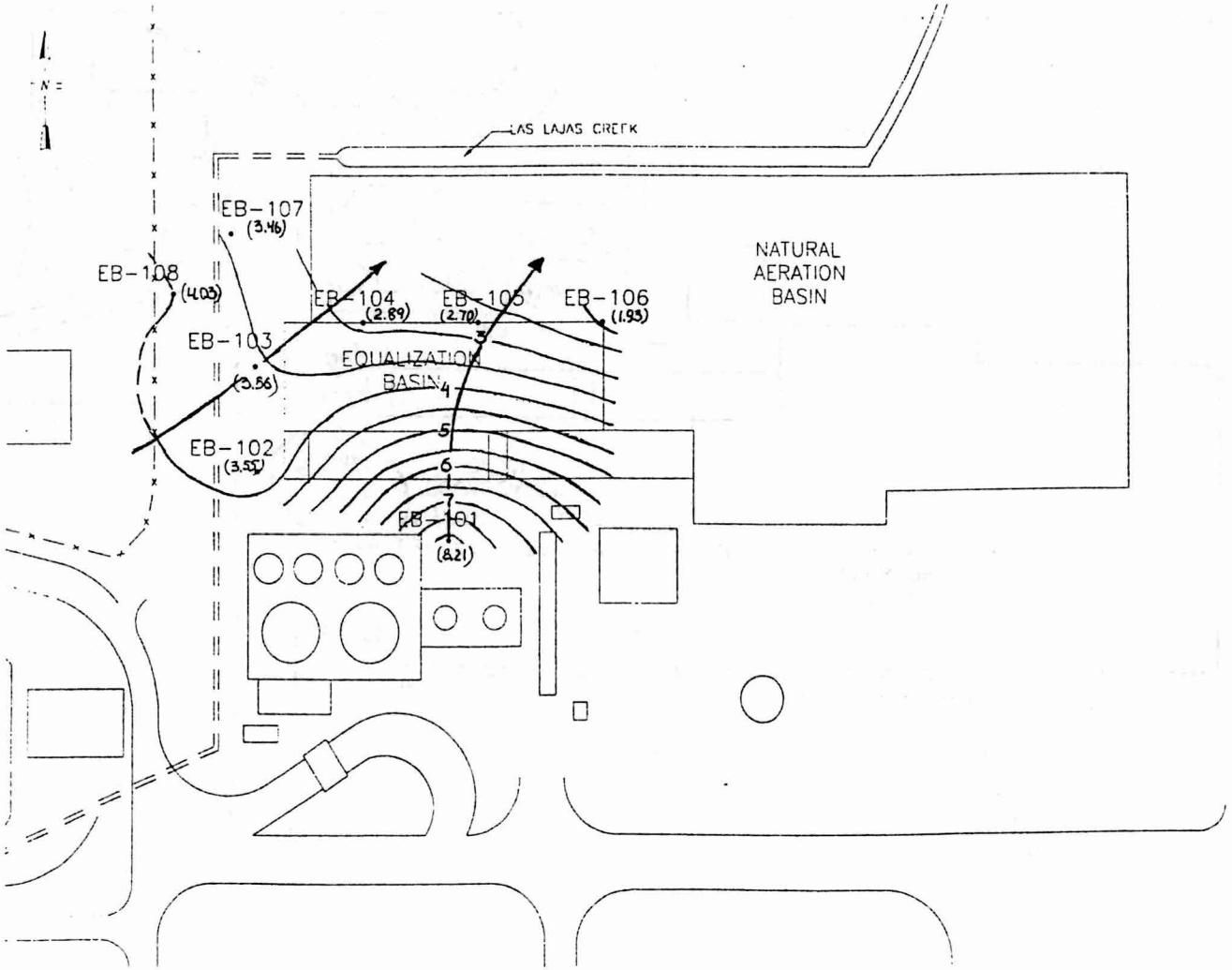


Figure 10-1

Groundwater Contour and Flow Map at CPC Equalization Basin

October 3, 1994

(Contour interval in feet amsl)

LEGEND

- • EB-103 — Groundwater Monitoring Well
- 5 —— — Groundwater Level Contour (feet amsl)
- Goundwater Flow Direction

0 100 200

Scale (feet)

Anderson-Mulhalland & Associates, Inc.
New York, New York

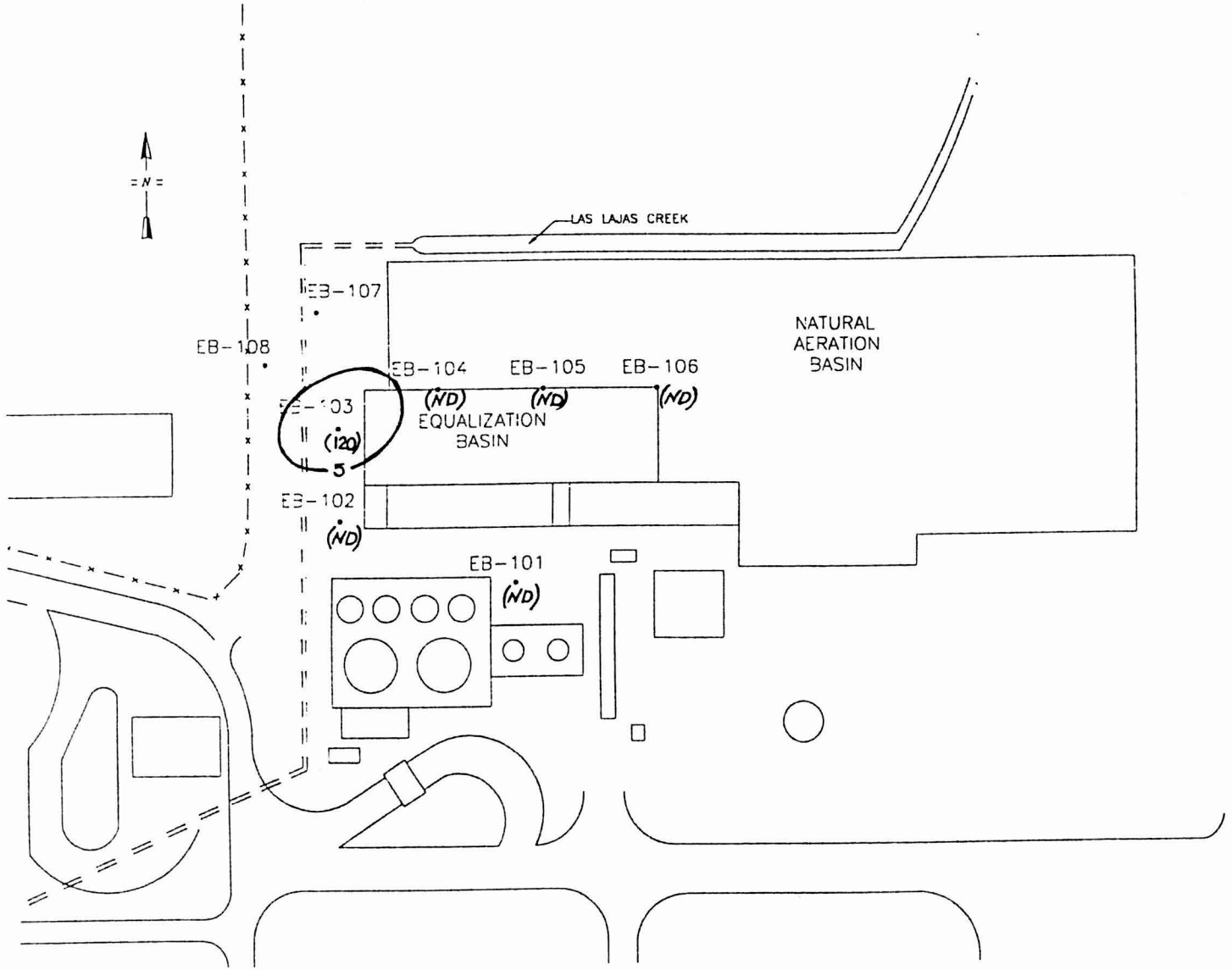


Figure 10-2

Dissolved Benzene Concentration at the CPC Equalization Basin

October 3-4, 1994

LEGEND

- **EB-103** **Ground Monitoring Well**

Concentration Contour (ug/l)

0 100 200

Scale (feet)

Anderson-Mulholland & Associates, Inc.
New York, New York

11. SOLID WASTE MANAGEMENT UNITS

Information on solid waste management units (SWMUs) at the CPC facility is presented in accordance with 40 CFR 270.14(d).

11.1 Equalization Basin

The Equalization Basin was designed and operated to equalize hydraulic and organic loadings into CPC's biological treatment units and to provide secondary oil/water/solids separation. The unit was placed in service in 1976 during the upgrading of CPC's wastewater treatment facilities. The unit ceased receipt of process wastewater on June 6, 1993. The basin has a capacity of approximately two million gallons. A diagram of the Equalization Basin (as it existed during operation) is included in Figure 11.1.

The unit consists of an unlined basin approximately 275′ long, 90′ wide, and 10′ deep. The basin is dug into native soil. Water level in the unit is below the surrounding land surface. The northern, eastern, and western sides of the unit are constructed of earthen dikes. The northern and eastern dikes are reinforced with steel sheet pilings. The southern side of the unit is the reinforced concrete wall of the adjacent biological treatment plant. The bottom surface of the basin is undisturbed native soil. While operational, the Equalization Basin received flow via a 6-inch, steel, aboveground pipe.

The Equalization Basin included a smaller, secondary chamber which acted as an inlet basin into Biological Reactor #1. This chamber is situated adjacent to the southwestern corner of the Equalization Basin. The chamber, which is approximately 50′ long, 15′ wide, and 9′ deep, is also unlined. It was separated from the main body of the Equalization Basin by a steel wall topped by a gate valve structure. Wastewater flowed by gravity into this chamber through two gate valves that were padlocked in the open position at all times. The western and southern sides of the chamber are constructed of earthen dikes. The eastern side consists of the reinforced concrete wall of the adjacent bioreactor. The bottom surface of this chamber is also undisturbed native soil. Effluent from the Equalization Basin flowed by gravity over the concrete sidewall into the bioreactor.

The Equalization Basin handled pretreated process wastewater as well as boiler blowdown, cooling water, and production area runoff. The unit managed the following hazardous wastes:

F038 - Secondary oil/water/solids separation sludge was managed in the unit. This waste is listed due to the possible presence of benzene, benzo(a)pyrene, chrysene, lead, and chromium. Sludge was removed form the unit in April 1994.

D018 - Wastewater exhibiting Toxicity Characteristic Leaching Procedure concentrations of benzene exceeding regulatory standards was discharged into the basin. Discharge of process wastewater ceased in June 1993. Currently, a small quantity of treated wastewater is circulated through the Equalization Basin to prevent stagnation of accumulated liquids.

Information relating to potential releases from the Equalization Basin is presented in Chapter 10 of this Application.

11.2 Other SWMUs

In addition to the Equalization Basin, CPC has identified 27 potential solid waste management units at the facility. A list of the SWMUs is presented in Table 11.1. The location of each of the SWMUs is presented in Figure 11.2.

Additional information on all SWMUs was presented in CPC's September 1991 RCA Part B Permit Application. Attachment X of the Part B included a report entitled "Solid Waste Management Unit Report." For each of the 27 SWMUs, the following information was presented, as available:

- Designation of type of unit
- General dimensions and structural description
- Dates of operation
- Specification of wastes managed at the unit.

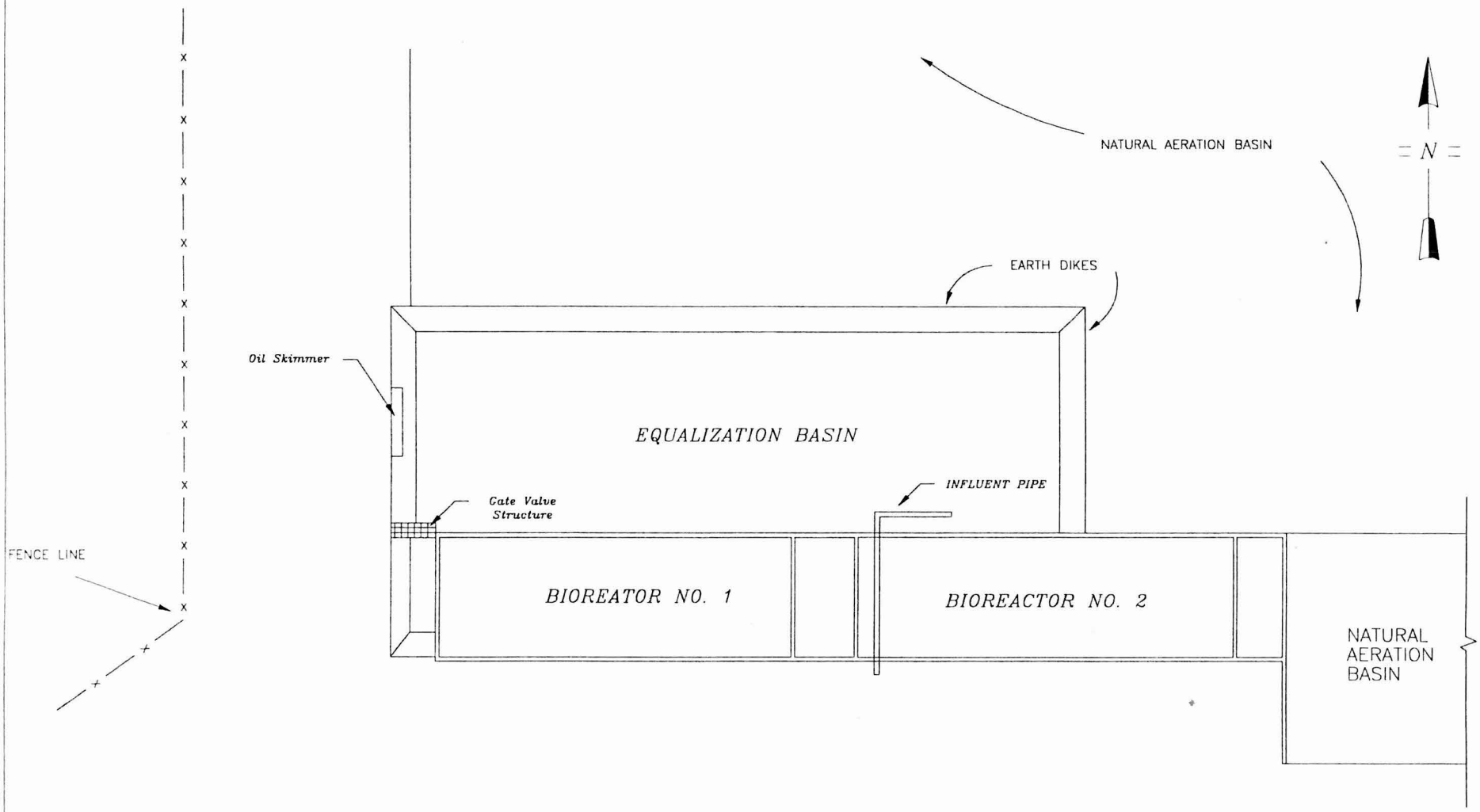
All available information relating to releases of hazardous constituents from the SWMUs was presented or referenced in Part II of the Solid Waste Management Unit Report.

Table 11.1

Potential Solid Waste Management Units

Caribbean Petroleum Corporation
Bayamon, Puerto Rico

SWMU 1	Process Sewers
SWMU 2	Solids Knockout Pit
SWMU 3	Process Wastewater Surge Tank ET-1
SWMU 4	API Separator
SWMU 5	Corrugated Plate Interceptor
SWMU 6	Depurator Unit
SWMU 7	Aeration Basin #1
SWMU 8	Clarifier #1
SWMU 9	Aeration Basin #2
SWMU 10	Clarifier #2
SWMU 11	Natural Aeration Basin
SWMU 12	Sand Filter Unit
SWMU 13	Stormwater Basin
SWMU 14	Digestor
SWMU 15	Centrifuge
SWMU 16	Gravity Thickener
SWMU 17	Container Storage Area
SWMU 18	Old East Separator
SWMU 19	Sulfur Pit
SWMU 20	Scrap Metal Yard
SWMU 21	Old Loading Rack
SWMU 22	Closed Surface Impoundment No. 1
SWMU 23	Closed Surface Impoundment No. 2
SWMU 24	Closed Disposal Site A
SWMU 25	Closed Disposal Site B
SWMU 26	Closed Disposal Site C
SWMU 27	Closed Disposal Site D



CARIBBEAN PETROLEUM CORPORATION		
FIGURE 11.1 EQUALIZATION BASIN (as it existed during operation)		
ANDERSON-MULHOLLAND & ASSOC., INC		
SCALE	AUTOCAD FILE #	DATE
DR: _____ CH: _____		

12. OTHER FEDERAL LAWS

Information in this section is being provided in accordance with the requirements of 40 CFR 270.3 and 270.14(b)(20).

Other federal laws, including the Wild and Scenic Rivers Act, National Historic Preservation Act of 1966, Endangered Species Act, Coastal Zone Management Act, and Fish and Wildlife Coordination Act are not applicable to CPC's Equalization Basin. Specifically, non-applicability of the above referenced statutes is demonstrated as follows:

- The Wild and Scenic Rivers Act - No rivers in the vicinity of CPC have been classified as wild and scenic.

- The National Historic Preservation Act - There are no properties in the vicinity of CPC that are listed or eligible for listing in the National Register of Historic Places.

- The Endangered Species Act - The fact that the Equalization Basin will not be operated during the post-closure care period precludes any potential threat to the continued existence of any endangered or threatened species or any condition which may adversely affect its critical habitat.

- The Coastal Zone Management Act - Activities associated with post-closure care of the Equalization Basin will not affect any land or water use in the coastal zone.

- The Fish and Wildlife Coordination Act - Activities associated with post-closure care of the Equalization Basin will not entail the impoundment, diversion, or other control or modification of any body of water.

Caribbean Petroleum Corporation

HAZARDOUS WASTE CONTAINER 90-DAY STORAGE AREA INSPECTION LOG

Inspector Name: _____

Inspection Date: _____ Time: _____

ITEM	PROBLEM	PASS	FAIL	OBSERVATION	REMEDIAL MEASURES
Container placement	Inadequate aisle space Labels not visible Unsafe stacking 90-day storage violations				
Labels	Improper description Improper waste code No accumulation date Not completed				
Condition of containers	Excessive corrosion Leakage Structural defects Open lids				
Base and Dikes	Cracks Spalling Settlement Erosion Standing water Staining				

Caribbean Petroleum Corporation

HAZARDOUS WASTE TRANSFER EQUIPMENT INSPECTION LOG

Inspector Name: _____

Inspection Date: _____ Time: _____

ITEM	PROBLEM	PASS	FAIL	OBSERVATION	REMEDIAL MEASURES
Piping	Leakage Breaks or cracks Corrosion				
Valves	Leakage Seal integrity Corrosion				
Pipe supports	Corrosion Structural integrity				
Pumps	Leakage Seal integrity Breaks/cracks in lines				
Flanges/caps	Leakage Corrosion				

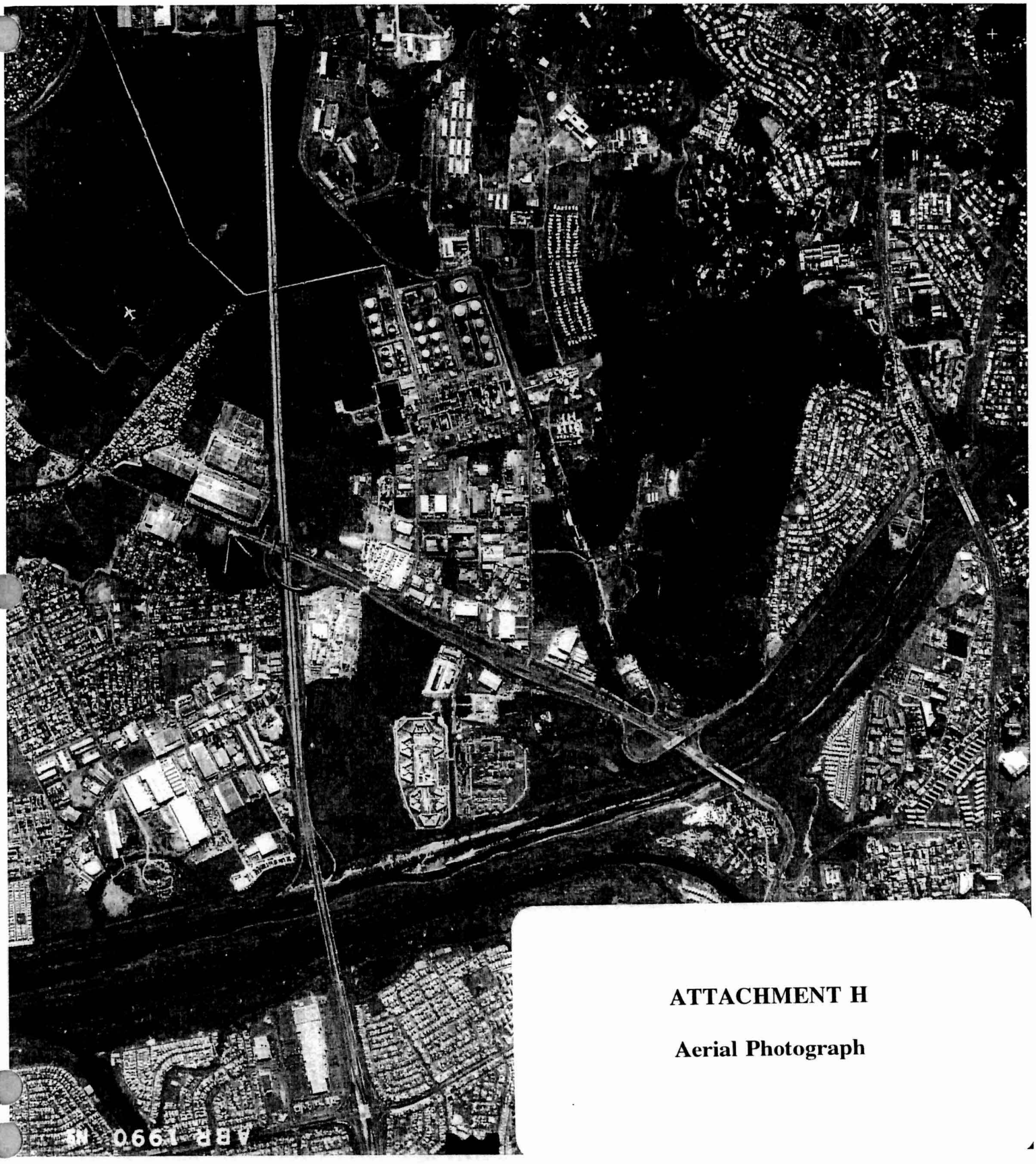
Caribbean Petroleum Corporation

EMERGENCY EQUIPMENT INSPECTION LOG

Inspector Name: _____

Inspection Date: _____ Time: _____

ITEM	PROBLEM	PASS	FAIL	OBSERVATION	REMEDIAL MEASURES
Facility fence	Damage				
Gates and locks	Sticking Corrosion				
Warning signs	Damaged Missing				
Spill control equipment					
- Absorbent	Less than ten bags				
- Spill socks	Less than two boxes				
- Spill pillows	Less than three boxes				
PPE					
- Tyvek suits	Less than one box				
- Latex gloves	Less than one box				
Telephone	Inoperable				
Two-way radio	Power failure				
Respirators	Inadequate supply Cartridges				



ATTACHMENT H

Aerial Photograph

POST-CLOSURE GROUNDWATER SAMPLING AND ANALYSIS PLAN
CPC EQUALIZATION BASIN, BAYAMON, PUERTO RICO

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